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BEAM POWER TUBE

Useful at Frequencies up to 125 Mc

GENERAL DATA

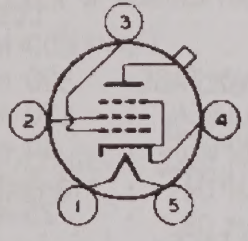
Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 0.6	ac or dc volts
Current	0.9	amp
Transconductance (Approx.) for plate volts = 250, grid-No.2 volts = 250, grid-No.1 volts = -14	6000	μmhos
Mu-Factor, Grid No.2 to Grid No.1 for plate volts = 250, grid-No.2 volts = 250, and grid-No.1 volts = -20	8	
Direct Interelectrode Capacitances:		
Grid No.1 to plate°	0.2 max.	μμf
Grid No.1 to cathode & grid No.3, grid No.2, and heater	12	μμf
Plate to cathode & grid No.3, grid No.2, and heater	7	μμf

Mechanical:

Mounting Position	Any
Maximum Overall Length	5-3/4"
Seated Length	4-31/32" ± 5/32"
Maximum Diameter	2-1/16"
Weight (Approx.)	3 oz
Bulb	ST-16
Cap	Small (JETEC No.C1-1)
Base . . . Medium-Micanol-Shell Small 5-Pin (JETEC No.A5-11)	
Basing Designation for BOTTOM VIEW	5AW

Pin 1 - Heater
Pin 2 - Grid No.2
Pin 3 - Grid No.1



Pin 4 - Cathode, Grid No.3
Pin 5 - Heater
Cap - Plate

AF POWER AMPLIFIER & MODULATOR - Class AB$_1$♦

Triode Connection--Grid No.2 Connected to Plate

Maximum Ratings, *Absolute Values:*

	CCS●	ICAS●●	
DC PLATE VOLTAGE	400 max.	400 max.	volts
MAX.-SIGNAL DC PLATE CURRENT*	125 max.	125 max.	ma
MAX.-SIGNAL DC PLATE PLUS GRID-No.2 INPUT*	50 max.	50 max.	watts
PLATE DISSIPATION PLUS GRID-No.2 INPUT*	25 max.	30 max.	watts

° with external shield JETEC No.312.

♦, ●, ●●, *: See next page.

← Indicates a change.

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	CCS●	ICAS●●	
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	135 max.	135 max.	volts
Heater positive with respect to cathode	135 max.	135 max.	volts

Typical Operation:●	CCS●	ICAS●●	
Values are for 2 tubes			
DC Plate Voltage	400	400	volts
DC Grid-No.1 (Control-Grid) Voltage.	−45	−45	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage●●.	90	90	volts
→ Zero-Signal DC Plate Current .	64	64	ma
Max.-Signal DC Plate Current .	140	140	ma
Effective Load Resistance (Plate to Plate)	3000	3000	ohms
Max.-Signal Driving Power (Approx.).	0	0	watts
Max.-Signal Power Output (Approx.).	15	15	watts

Maximum Circuit Values (CCS or ICAS):

Grid-No.1-Circuit Resistance:○○		
With fixed bias.	0.1 max.	megohm
With cathode bias.	0.5 max.	megohm

AF POWER AMPLIFIER & MODULATOR - Class AB_1♦

Maximum Ratings, *Absolute Values*:

	CCS●	ICAS●●	
DC PLATE VOLTAGE	600 max.	750 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE.	300 max.	300 max.	volts
MAX.-SIGNAL DC PLATE CURRENT*.	120 max.	120 max.	ma
MAX.-SIGNAL DC PLATE INPUT*. .	60 max.	90 max.	watts
MAX.-SIGNAL GRID-No.2 INPUT* .	3.5 max.	3.5 max.	watts
PLATE DISSIPATION*	25 max.	30 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	135 max.	135 max.	volts
Heater positive with respect to cathode	135 max.	135 max.	volts

♦ Subscript 1 indicates that grid-No.1 current does not flow during any part of the input cycle.

● In class AB_1 service, the normal design limitation is the requirement that grid-No.1 current should not flow. For this reason, the typical operating values shown for both CCS and ICAS conditions are the same.

●● The driver stage should be capable of supplying the No.1 grids of the class AB_1 stage with the specified driving voltage at low distortion.

●, ●●, *, ○○: See next page.

→indicates a change.

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BEAM POWER TUBE

Typical Operation:	CCS●			ICAS●●	
Values are for 2 tubes					
DC Plate Voltage	400	500	600	750	volts
DC Grid-No.2 Voltage**	300	300	300	300	volts
DC Grid-No.1 (Control-Grid) Voltage:					
From fixed-bias source	-30	-32	-34	-35	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	60	64	68	70	volts
Zero-Signal DC Plate Current	56	44	36	30	ma
Max.-Signal DC Plate Current	143	141	139	139	ma
Zero-Signal DC Grid-No.2 Current	2	1	0.6	0.5	ma
Max.-Signal DC Grid-No.2 Current	16	15	15	16	ma
Effective Load Resistance (Plate to plate)	6800	8200	10000	12000	ohms
Max.-Signal Driving Power (Approx.)	0	0	0	0●	watts
Max.-Signal Power Output (Approx.)	36	46	56	72	watts

Maximum Circuit Values (CCS or ICAS):

Grid-No.1-Circuit Resistance:○○
- With fixed bias . . . . . 0.1 max. megohm
- With cathode bias . . . . . Not recommended

AF POWER AMPLIFIER & MODULATOR - Class AB_2#

Maximum Ratings, *Absolute Values*:

	CCS●	ICAS●●	
DC PLATE VOLTAGE	600 max.	750 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	300 max.	300 max.	volts
MAX.-SIGNAL DC PLATE CURRENT*	120 max.	120 max.	ma
MAX.-SIGNAL PLATE INPUT*	60 max.	90 max.	watts
MAX.-SIGNAL GRID-No.2 INPUT*	3.5 max.	3.5 max.	watts
PLATE DISSIPATION*	25 max.	30 max.	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	135 max.	135 max.	volts
Heater positive with respect to cathode	135 max.	135 max.	volts

\# Subscript 2 indicates that the grid-No.1 current flows during some part of the input cycle.

* Averaged over any audio-frequency cycle of sine-wave form.

●, ●●, **, ○○: See next page.

←Indicates a change.

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BEAM POWER TUBE

Typical Operation:	CCS●			ICAS●●	
Values are for 2 tubes					
DC Plate Voltage	400	500	600	750	volts
DC Grid-No.2 Voltage**	300	300	300	300	volts
DC Grid-No.1 (Control-Grid) Voltage:					
From fixed-bias source	-28	-30	-32	-35	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	80	86	90	96	volts
Zero-Signal DC Plate Current	72	60	48	30	ma
Max.-Signal DC Plate Current	240	240	200	240	ma
Zero-Signal DC Grid-No.2 Current	2	0.9	0.7	0.5	ma
Max.-Signal DC Grid-No.2 Current	20	20	18	20	ma
Effective Load Resistance (Plate to plate)	3700	4600	6900	7300	ohms
Max.-Signal Driving Power (Approx.)◆◆	0.2	0.2	0.1	0.2	watt
Max.-Signal Power Output (Approx.)▲	55	75	80	120	watts

Maximum Circuit Values (CCS or ICAS):

Grid-No.1-Circuit Resistance:∞

With fixed bias	30000 max.	ohms
With cathode bias	Not recommended	

RF POWER AMPLIFIER-Class B Telephony

Carrier conditions per tube for use with a max. modulation factor of 1.0

Maximum Ratings, *Absolute Values:*

	CCS●	ICAS●●	
DC PLATE VOLTAGE	600 max.	750 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	300 max.	300 max.	volts
DC PLATE CURRENT	80 max.	90 max.	ma
PLATE INPUT	37.5 max.	45 max.	watts
GRID-No.2 INPUT	2.5 max.	2.5 max.	watts

** Preferably obtained from a separate source, or from the plate-voltage supply with a voltage divider.

◆◆ Driver stage should be capable of supplying the specified driving power at low distortion to the No.1 grids of the class AB_2 stage. The effective resistance per grid-No.1 circuit of the class AB_2 stage should be kept below 500 ohms and the effective impedance should not exceed 700 ohms at the highest response frequency.

▲ With zero-impedance driver and perfect regulation, plate-circuit distortion does not exceed 2%. In practice, the regulation of the plate-voltage, grid-No.2 voltage, and grid-No.1 voltage should not be greater than 5%, 5%, and 3%, respectively.

●, ●●, ∞: See next page.

→ Indicates a change.

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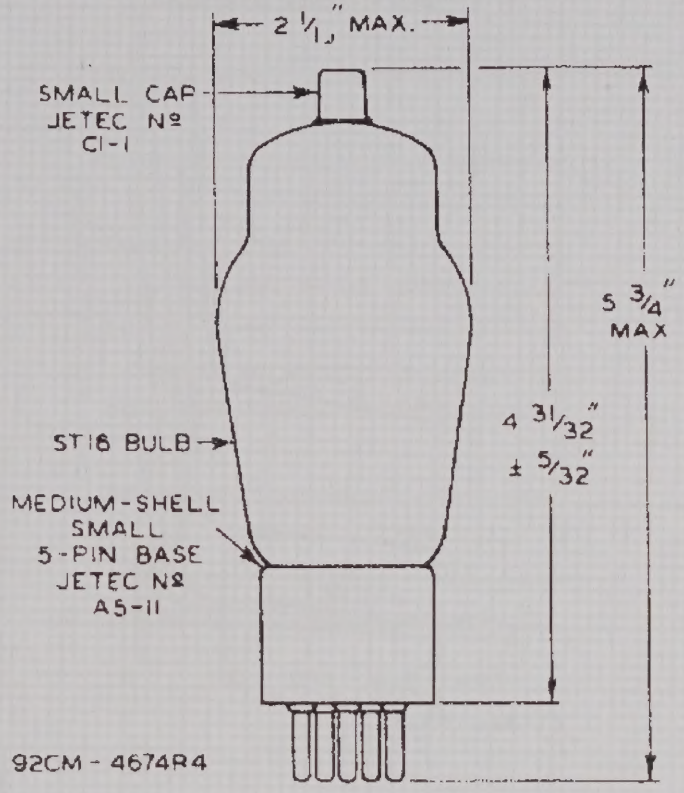

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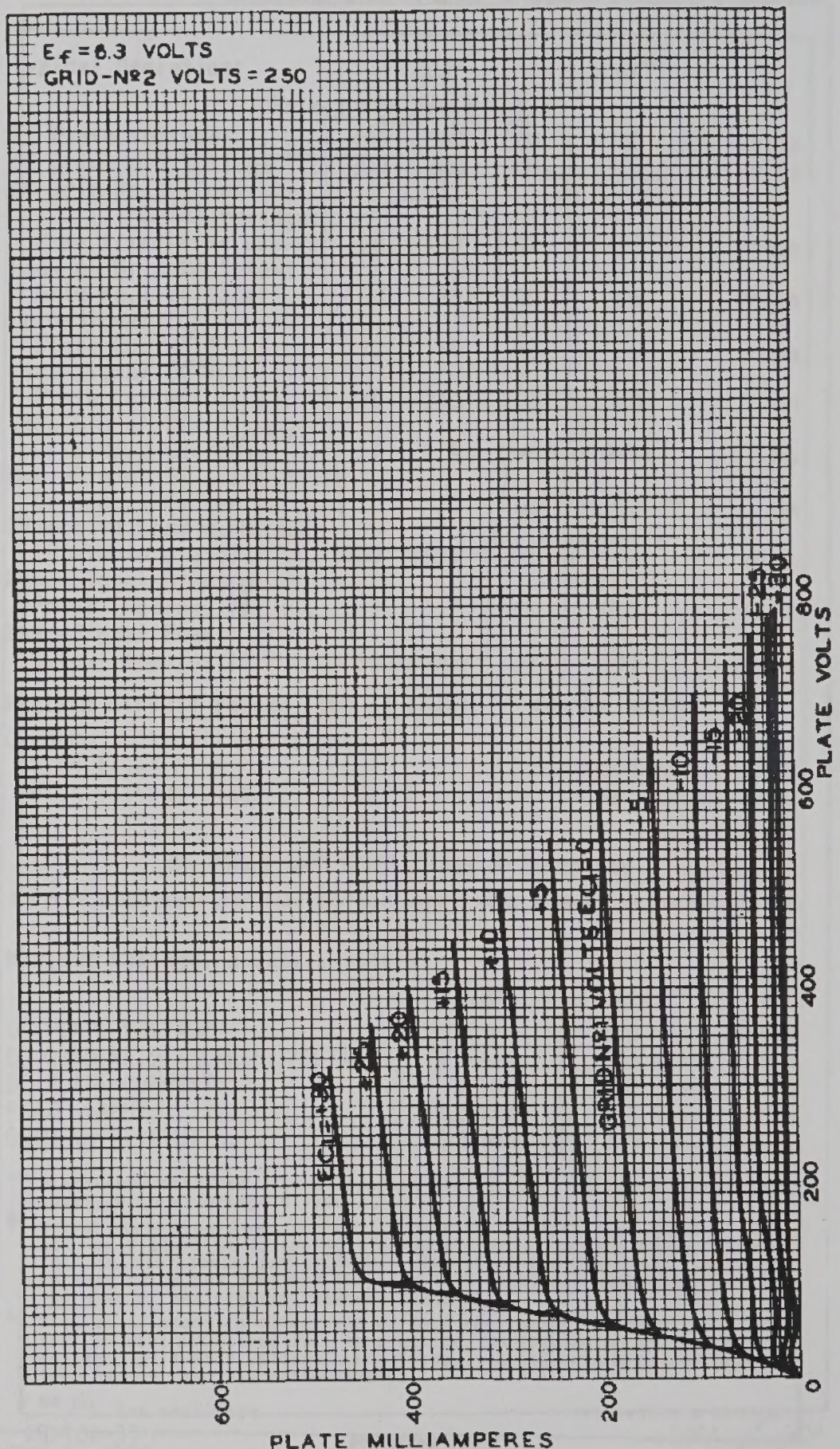
AVERAGE PLATE CHARACTERISTICS



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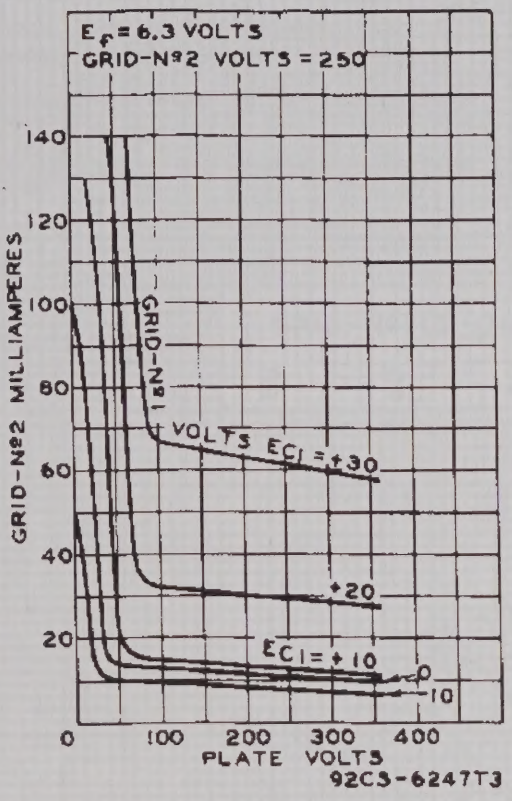
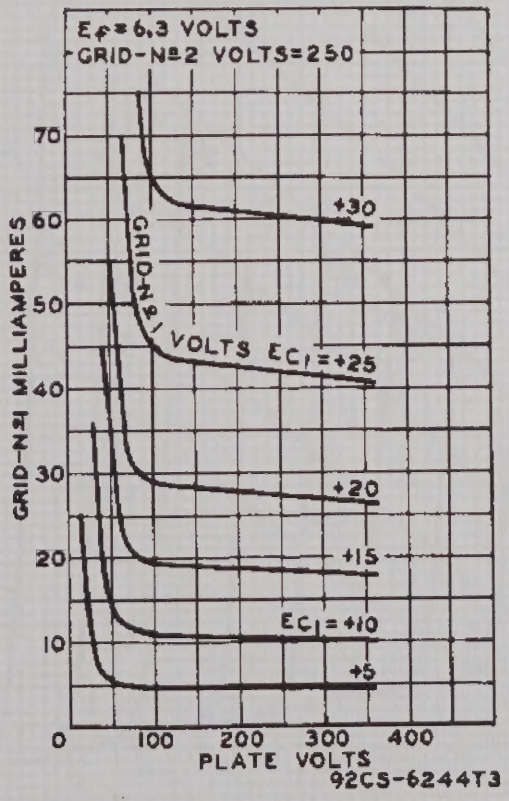
AVERAGE CHARACTERISTICS





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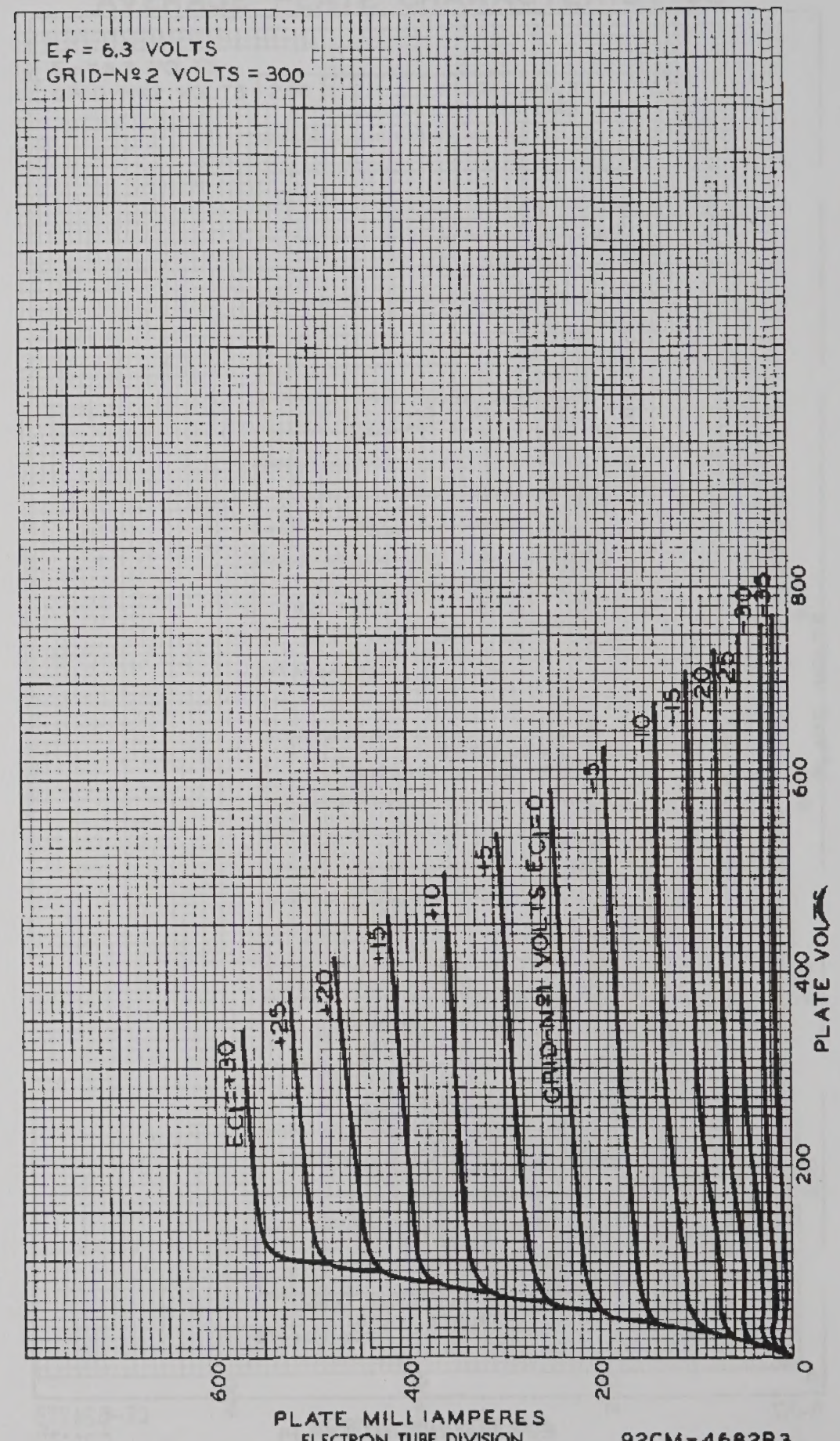
AVERAGE PLATE CHARACTERISTICS



ELECTRON TUBE DIVISION

92CM-4682R3

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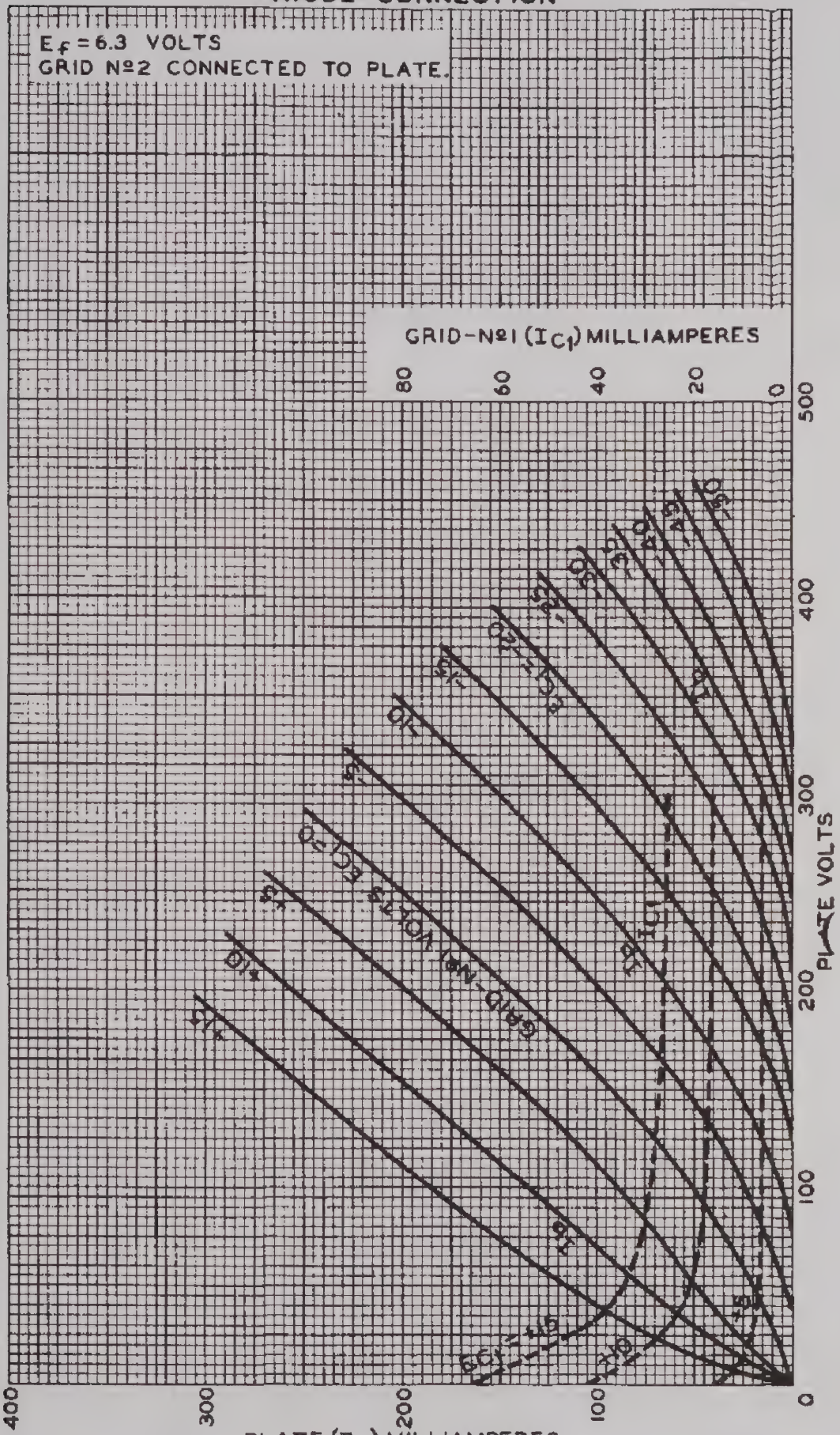
AVERAGE CHARACTERISTICS

TRIODE CONNECTION



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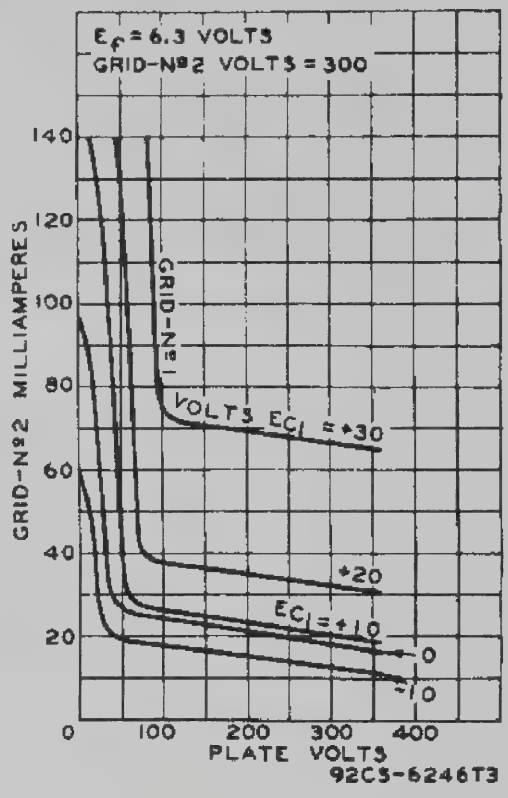
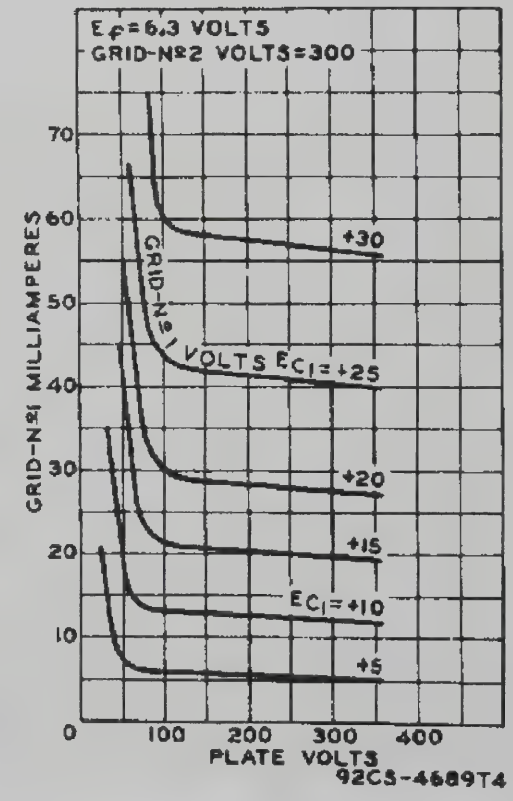
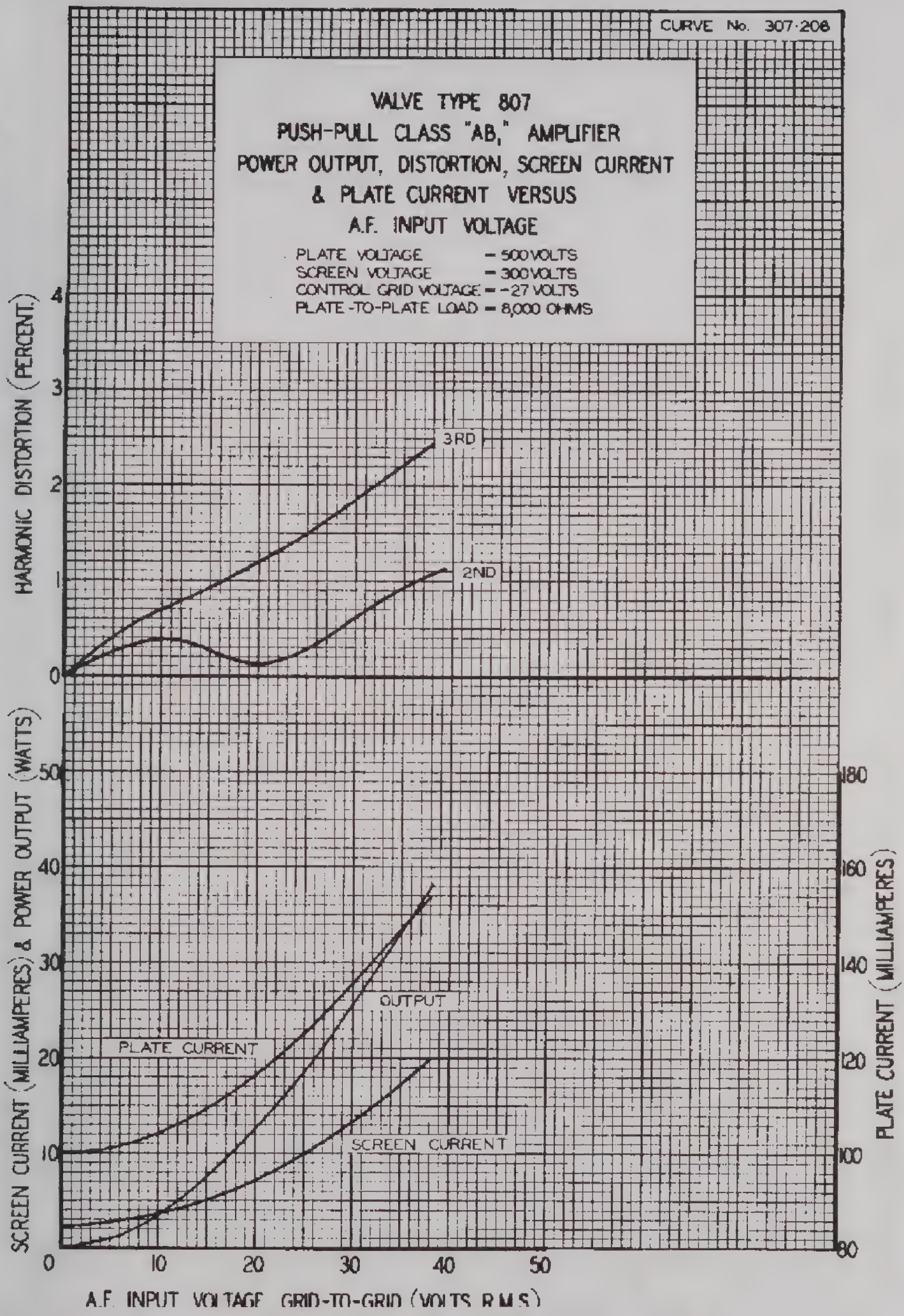
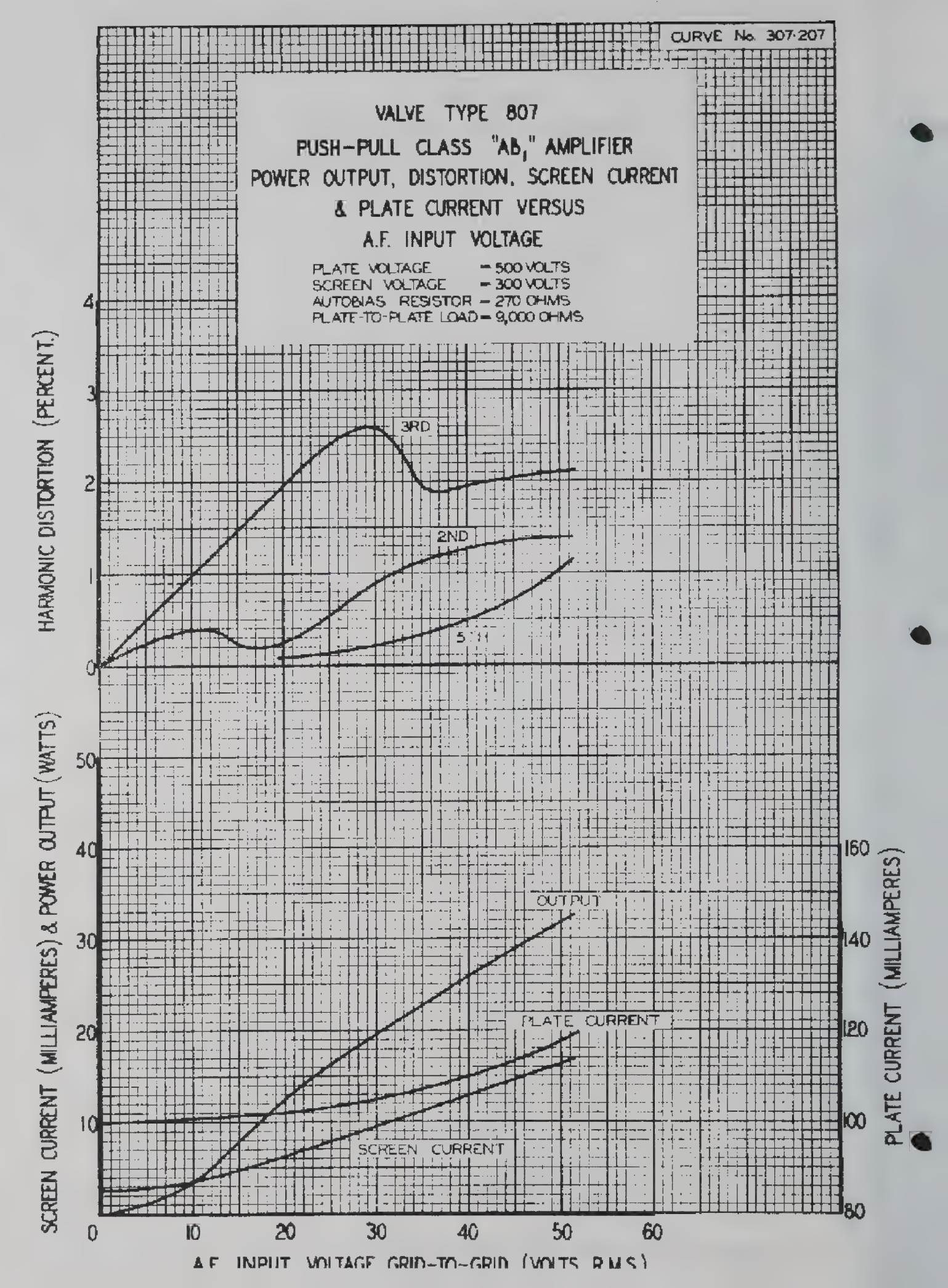
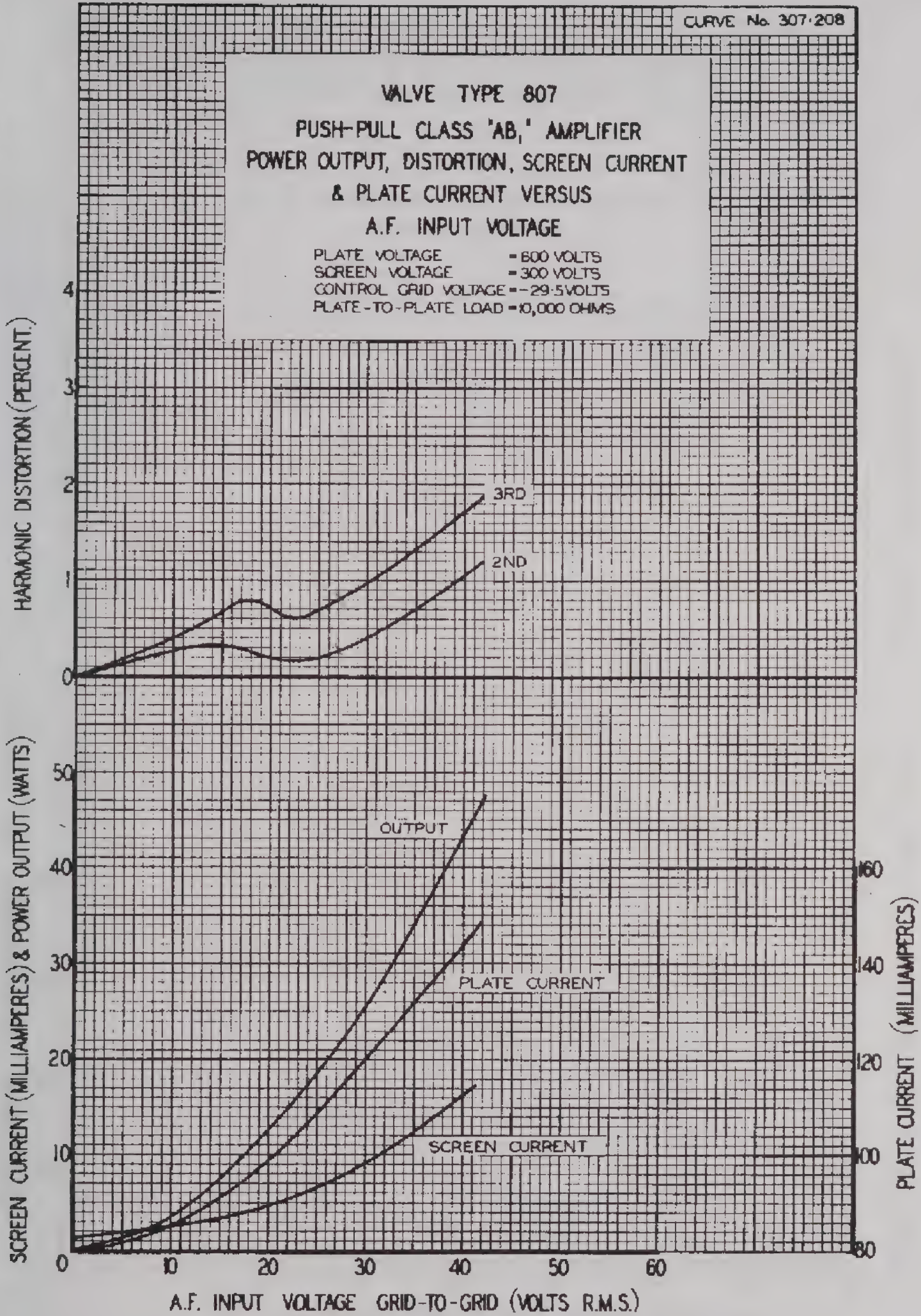
AVERAGE CHARACTERISTICS

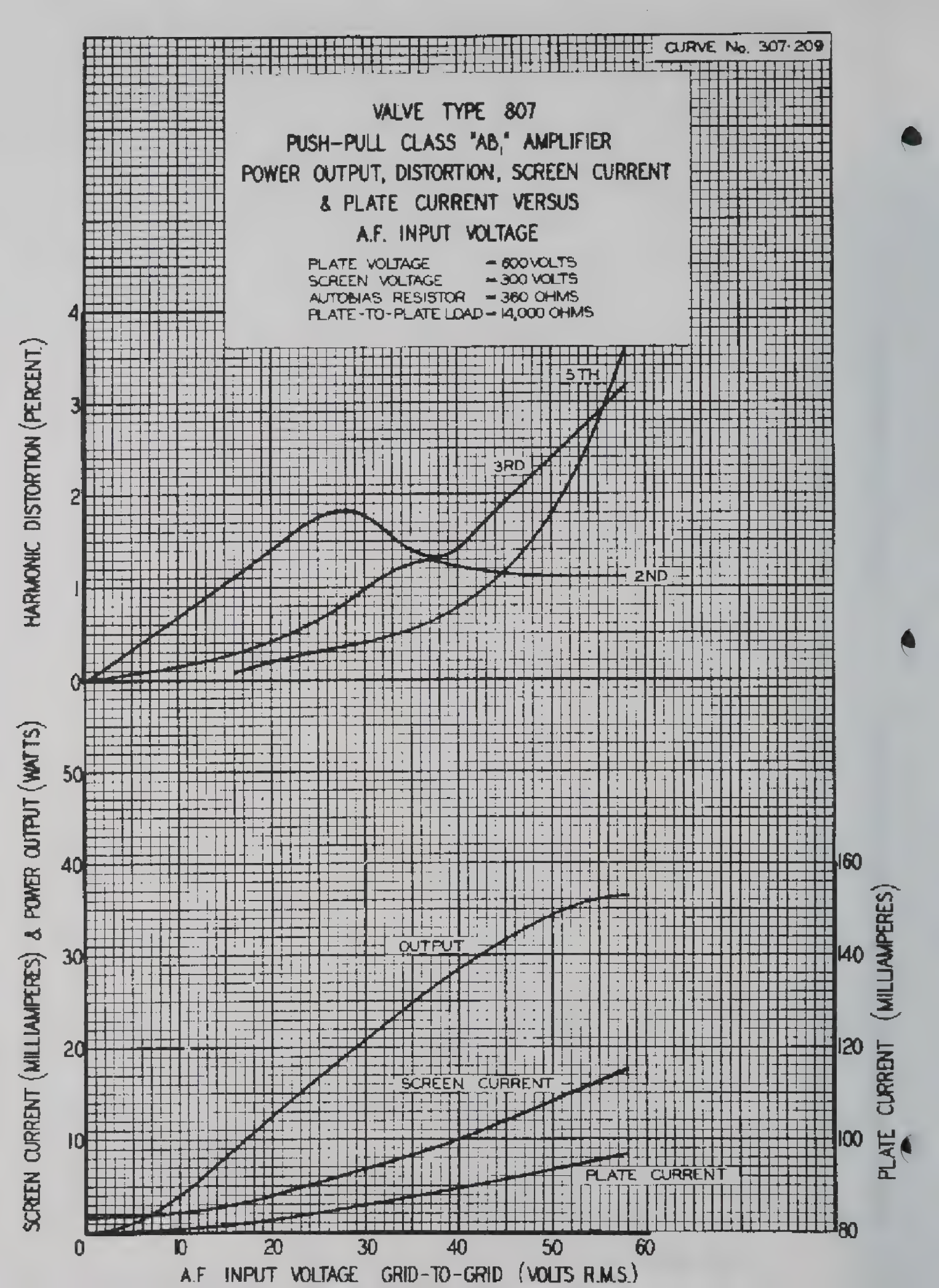


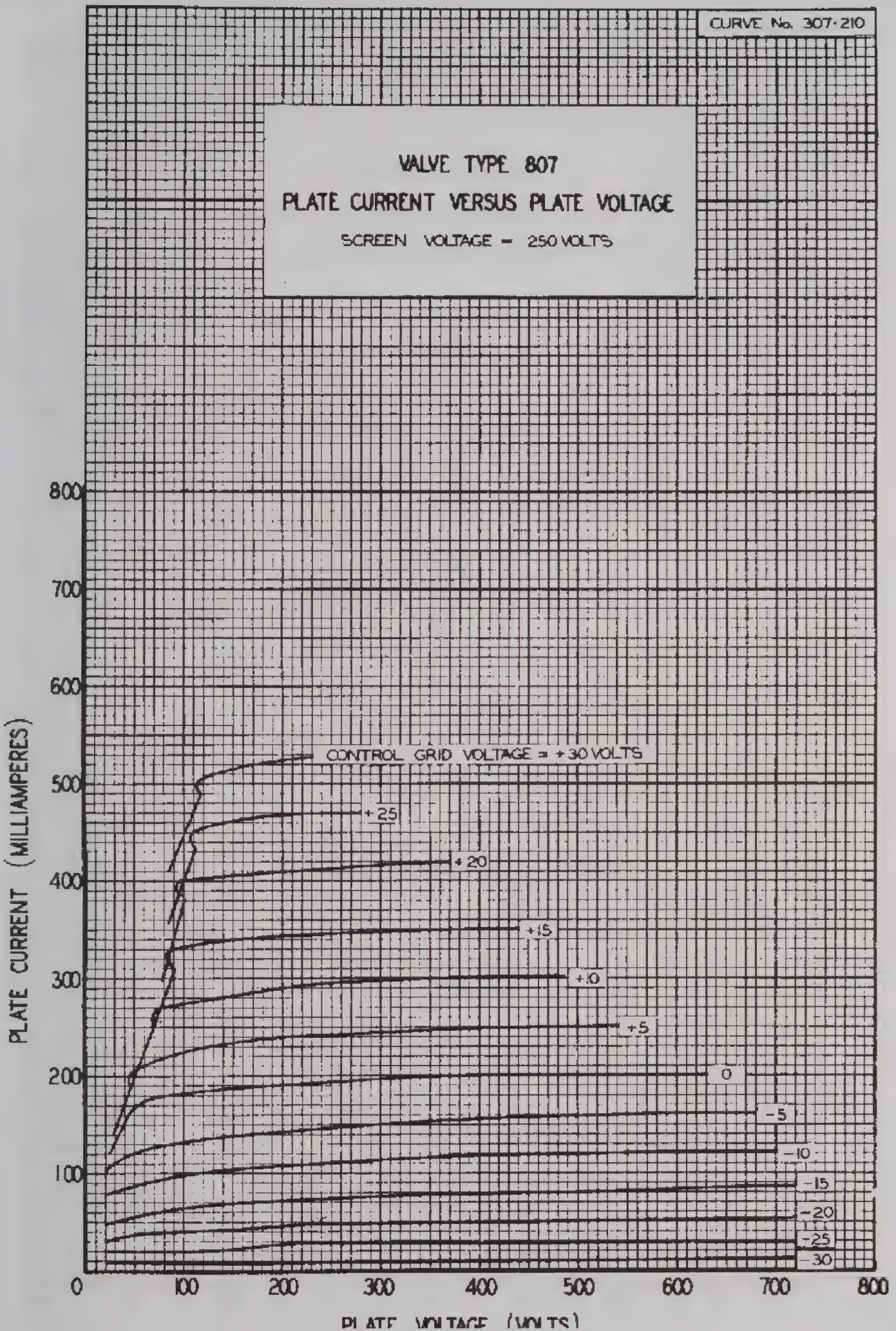



CURVE No. 307-208
VALVE TYPE 807
PUSH-PULL CLASS "AB," AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 500 VOLTS
SCREEN VOLTAGE = 300 VOLTS
CONTROL GRID VOLTAGE = -27 VOLTS
PLATE-TO-PLATE LOAD = 8,000 OHMS
HARMONIC DISTORTION (PERCENT.)
3RD
2ND
SCREEN CURRENT (MILLIAMPERES) & POWER OUTPUT (WATTS)
PLATE CURRENT (MILLIAMPERES)
OUTPUT
PLATE CURRENT
SCREEN CURRENT
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)


CURVE No. 307-207
VALVE TYPE 807
PUSH-PULL CLASS "AB1" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 500 VOLTS
SCREEN VOLTAGE = 300 VOLTS
AUTOBIAS RESISTOR = 270 OHMS
PLATE-TO-PLATE LOAD = 9,000 OHMS
3RD
2ND
5TH
OUTPUT
PLATE CURRENT
SCREEN CURRENT
HARMONIC DISTORTION (PERCENT.)
SCREEN CURRENT (MILLIAMPERES) & POWER OUTPUT (WATTS)
PLATE CURRENT (MILLIAMPERES)
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)
0
1
2
3
4
10
20
30
40
50
60
80
100
120
140
160


CURVE No. 307-208
VALVE TYPE 807
PUSH-PULL CLASS 'AB1' AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 600 VOLTS
SCREEN VOLTAGE = 300 VOLTS
CONTROL GRID VOLTAGE = -29.5 VOLTS
PLATE-TO-PLATE LOAD = 10,000 OHMS
HARMONIC DISTORTION (PERCENT.)
3RD
2ND
OUTPUT
PLATE CURRENT
SCREEN CURRENT
SCREEN CURRENT (MILLIAMPERES) & POWER OUTPUT (WATTS)
PLATE CURRENT (MILLIAMPERES)
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)


CURVE No. 307-209
VALVE TYPE 807
PUSH-PULL CLASS "AB1" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 600 VOLTS
SCREEN VOLTAGE = 300 VOLTS
AUTOBIAS RESISTOR = 360 OHMS
PLATE-TO-PLATE LOAD = 14,000 OHMS
5TH
3RD
2ND
OUTPUT
SCREEN CURRENT
PLATE CURRENT
HARMONIC DISTORTION (PERCENT.)
SCREEN CURRENT (MILLIAMPERES) & POWER OUTPUT (WATTS)
PLATE CURRENT (MILLIAMPERES)
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)
0
1
2
3
4
10
20
30
40
50
60
80
100
120
140
160

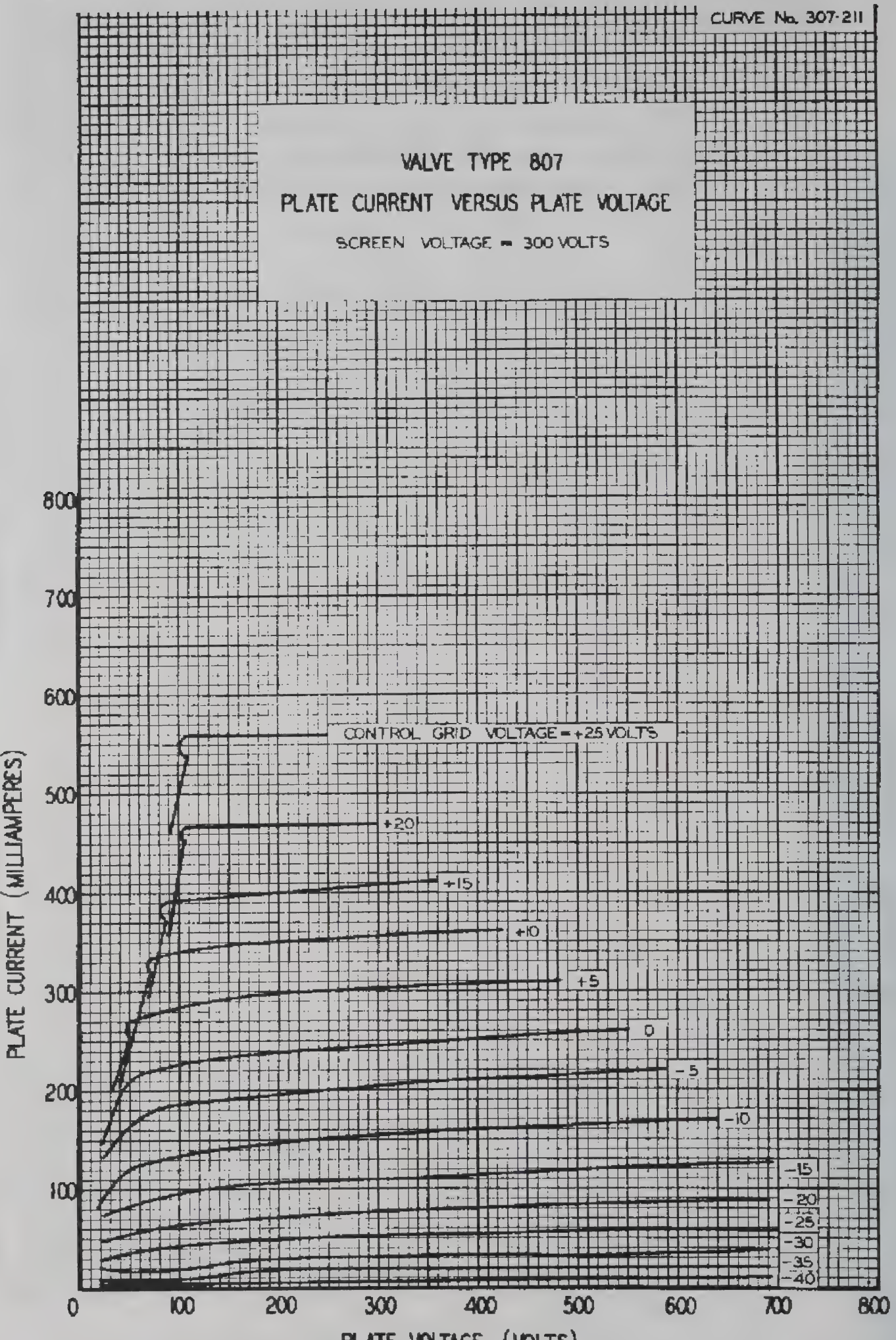

CURVE No. 307-210
VALVE TYPE 807
PLATE CURRENT VERSUS PLATE VOLTAGE
SCREEN VOLTAGE = 250 VOLTS
CONTROL GRID VOLTAGE = +30 VOLTS
+25
+20
+15
+10
+5
0
-5
-10
-15
-20
-25
-30
PLATE CURRENT (MILLIAMPERES)
PLATE VOLTAGE (VOLTS)
0
100
200
300
400
500
600
700
800

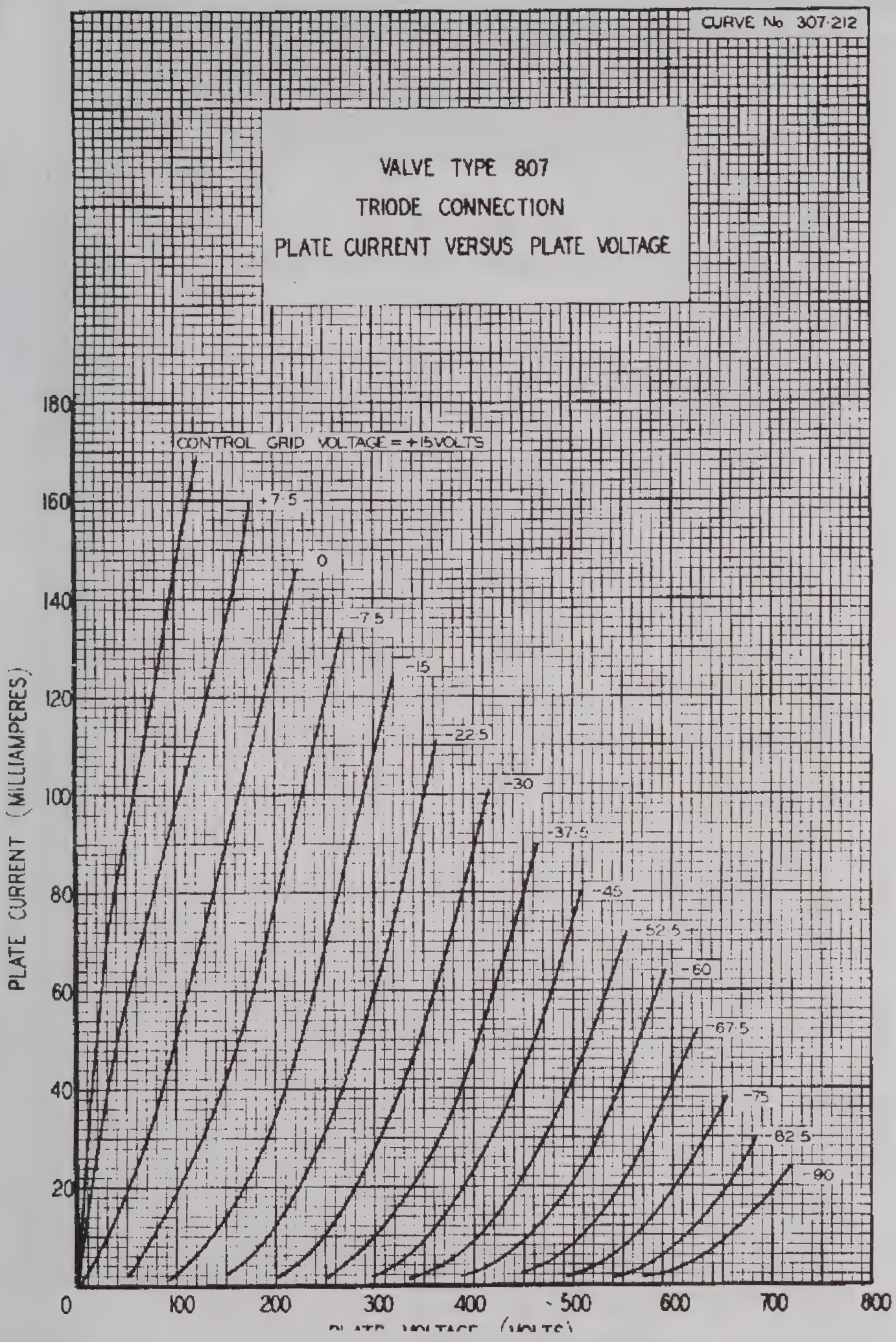
CURVE No. 307-211

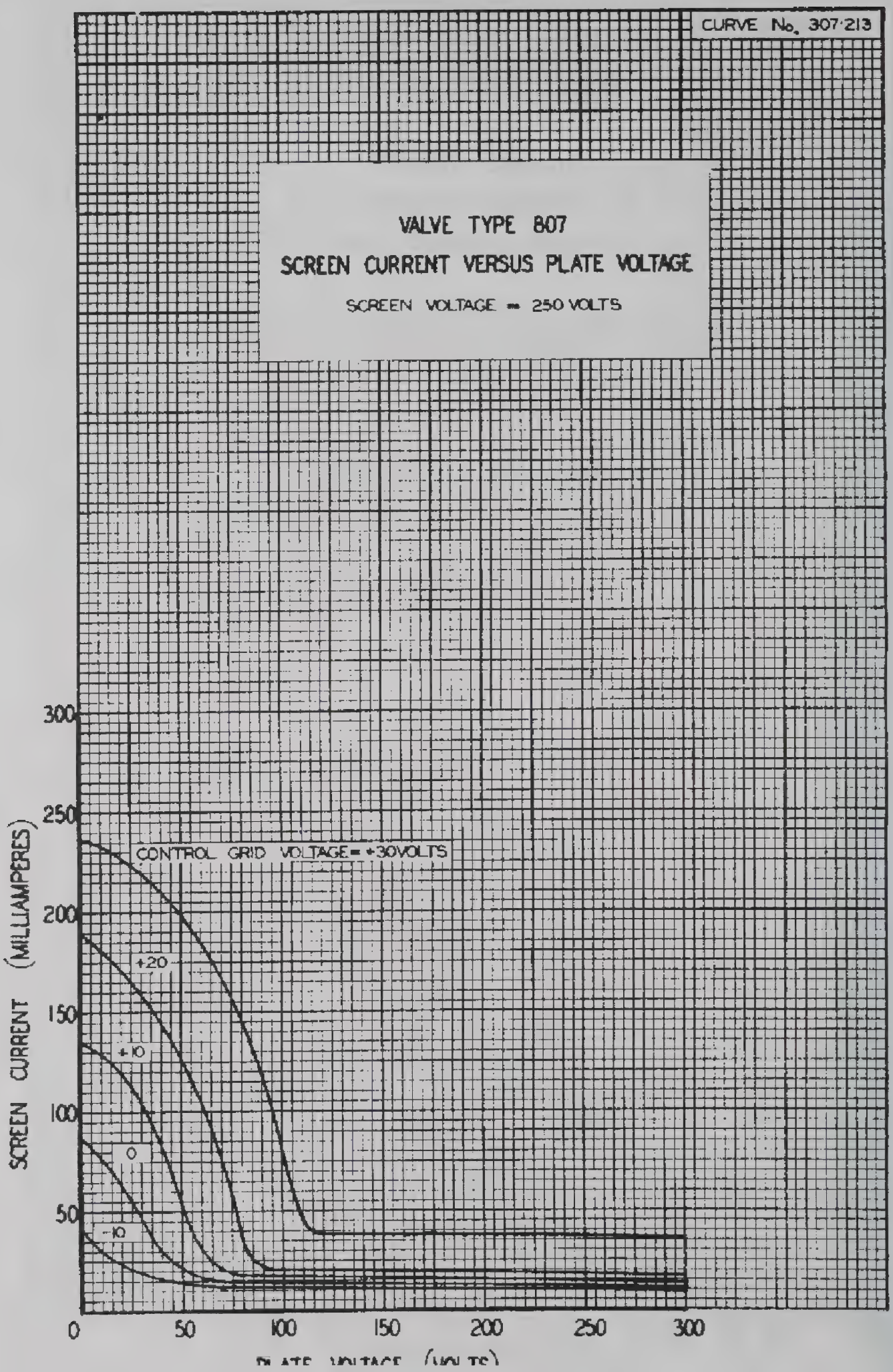
VALVE TYPE 807

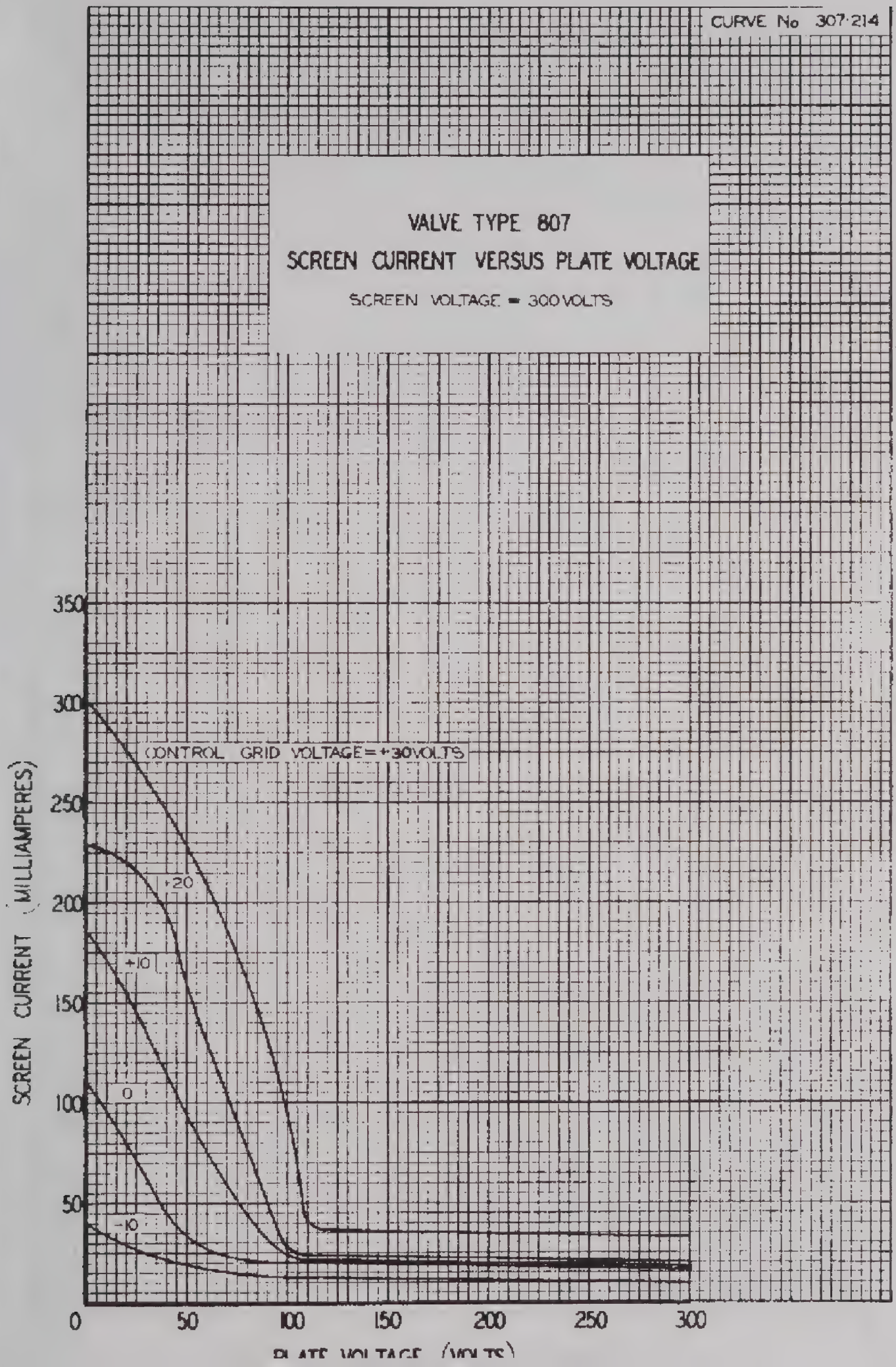
PLATE CURRENT VERSUS PLATE VOLTAGE

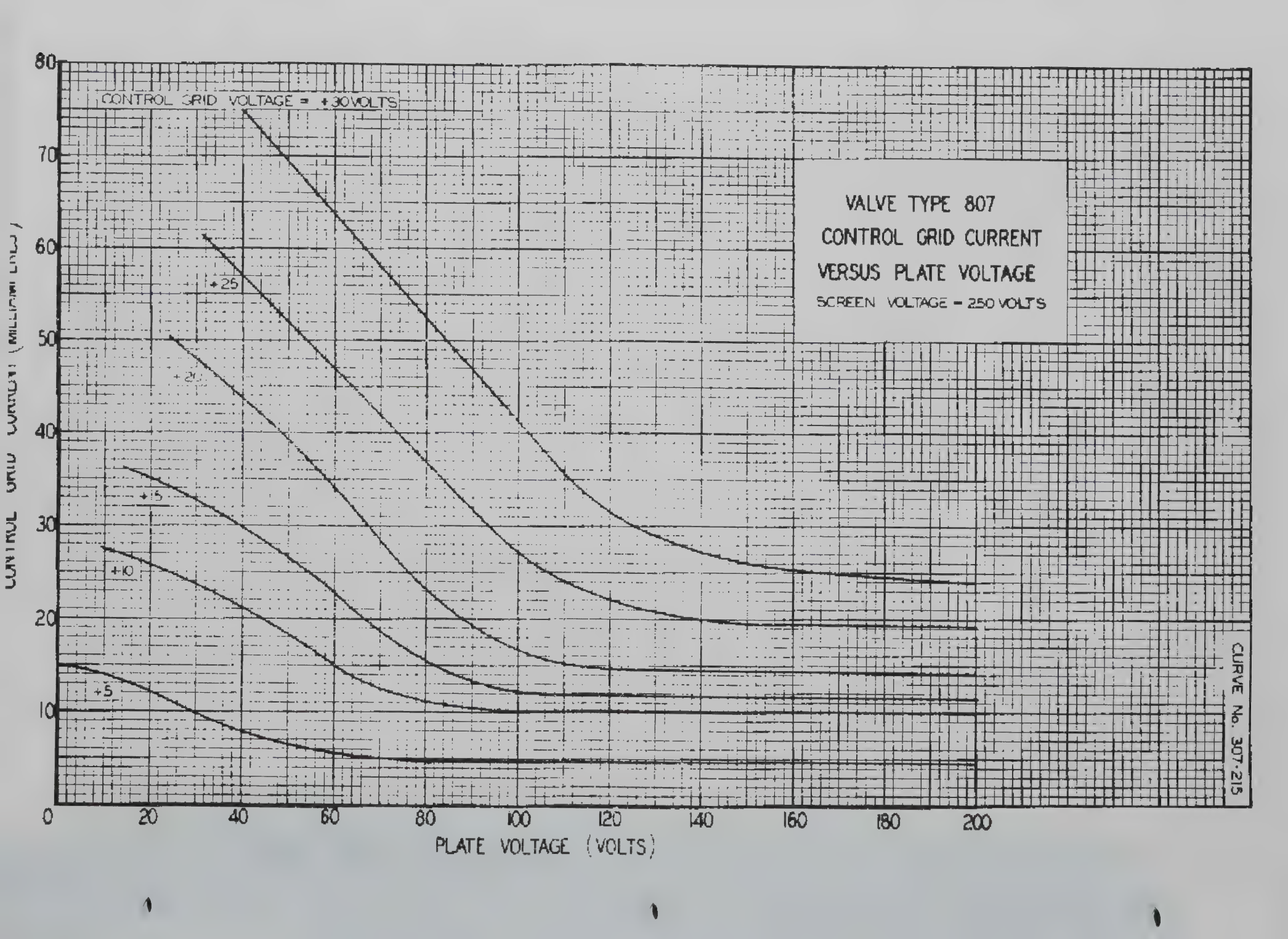
SCREEN VOLTAGE = 300 VOLTS

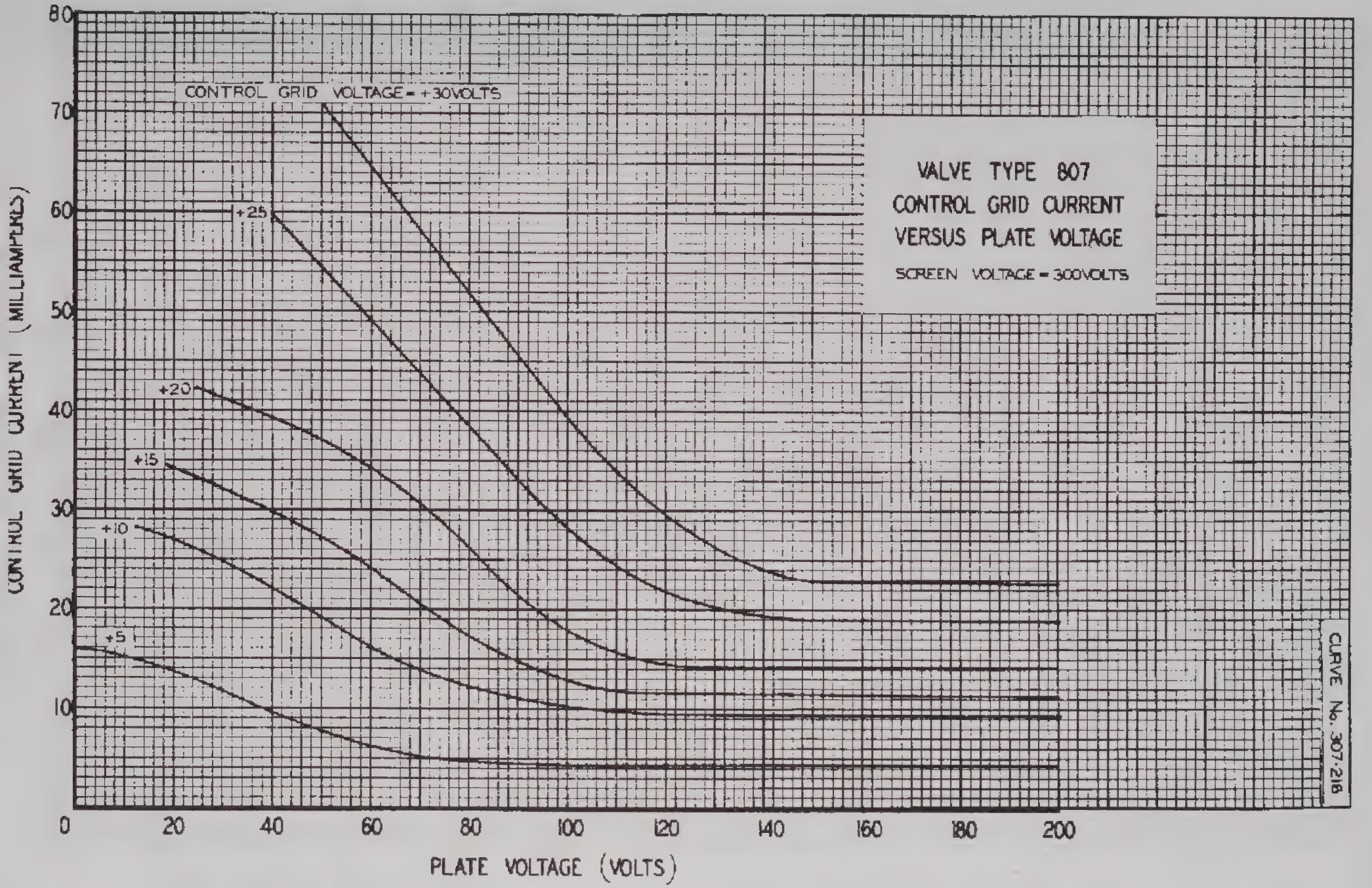


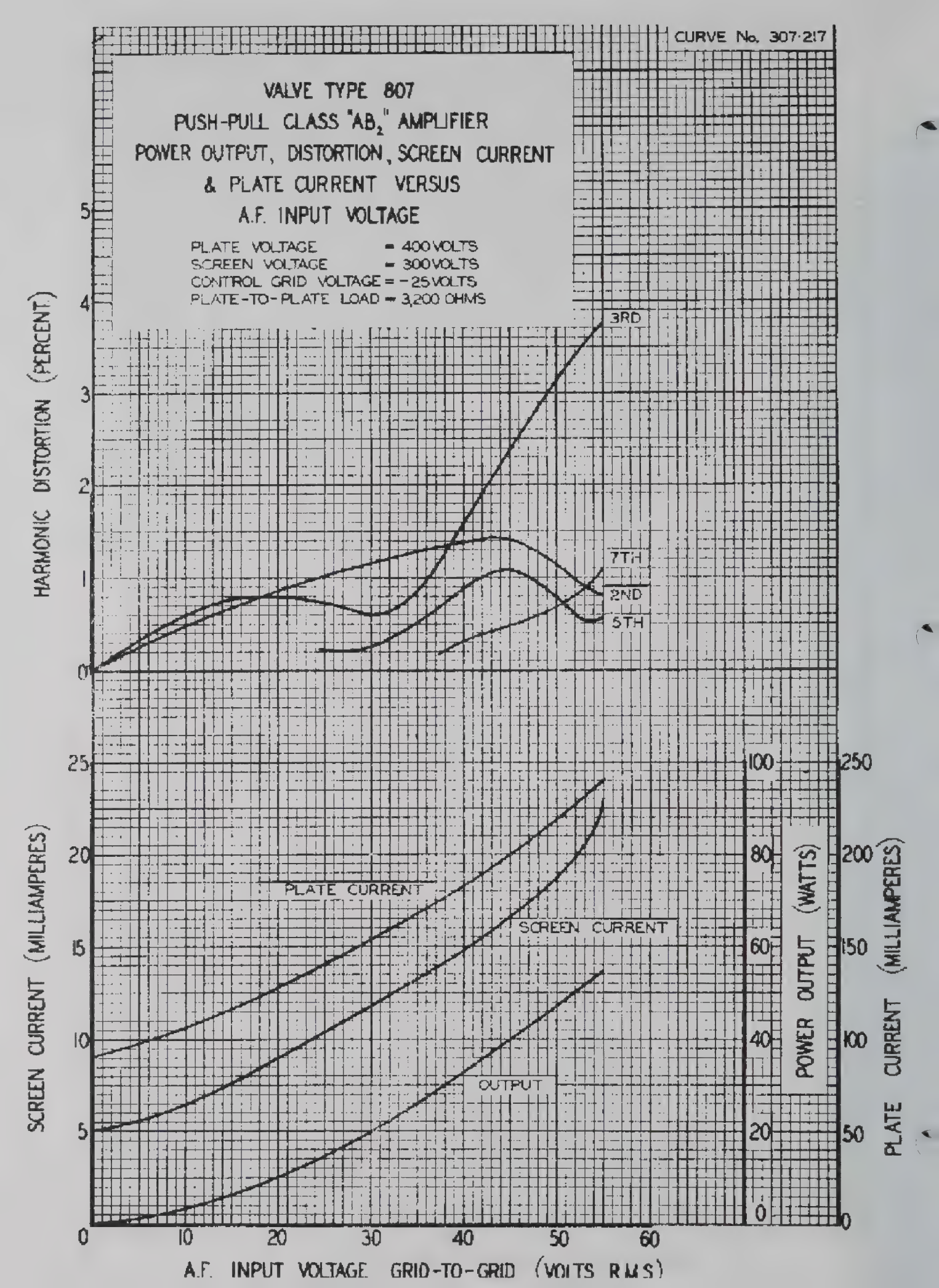

CURVE No 307-212
VALVE TYPE 807
TRIODE CONNECTION
PLATE CURRENT VERSUS PLATE VOLTAGE
CONTROL GRID VOLTAGE = +15 VOLTS
+7·5
0
-7·5
-15
-22·5
-30
-37·5
-45
-52·5
-60
-67·5
-75
-82·5
-90
PLATE CURRENT (MILLIAMPERES)
180
160
140
120
100
80
60
40
20
0
100
200
300
400
500
600
700
800

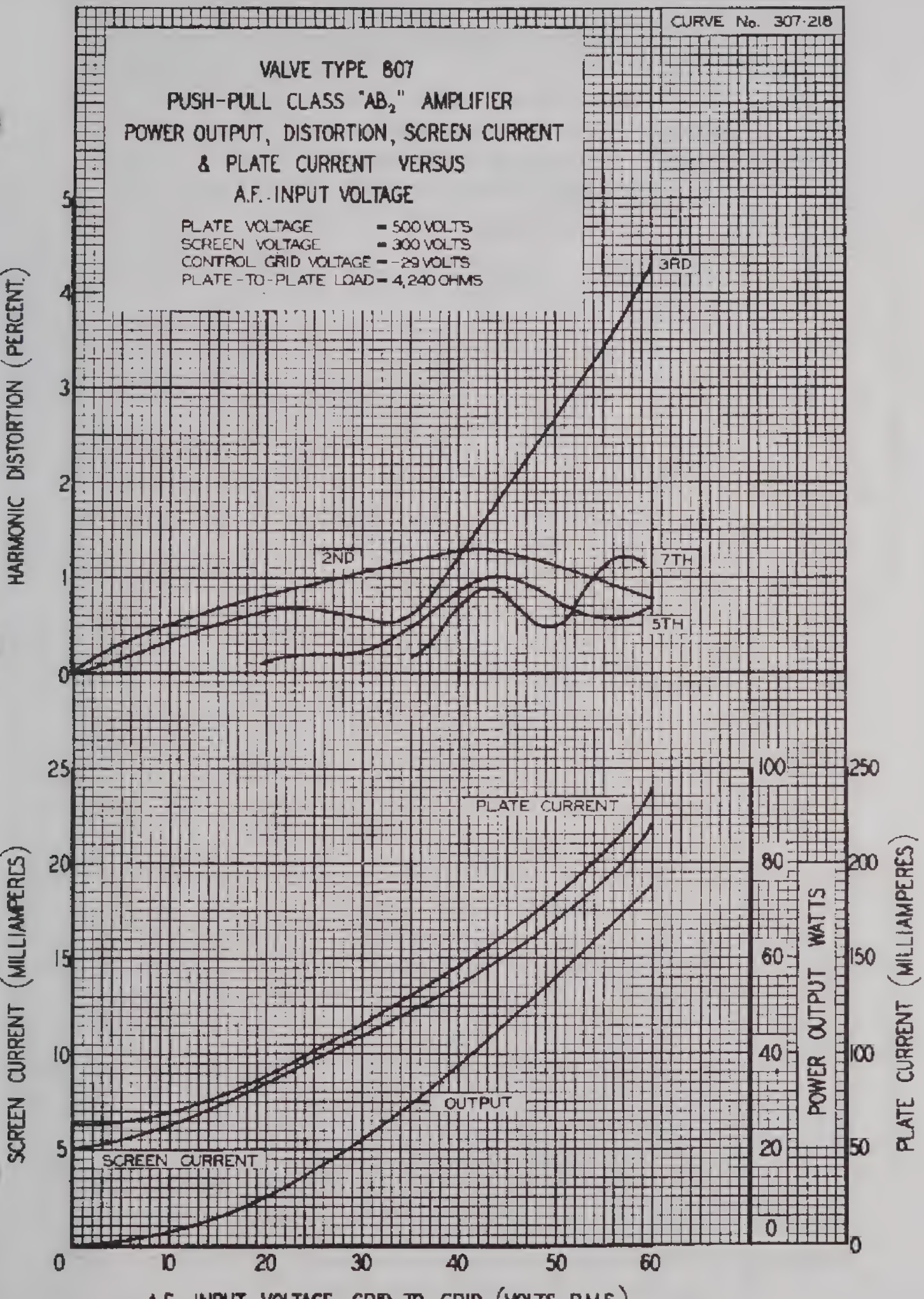

CURVE No. 307·213
VALVE TYPE 807
SCREEN CURRENT VERSUS PLATE VOLTAGE
SCREEN VOLTAGE = 250 VOLTS
CONTROL GRID VOLTAGE = +30 VOLTS
+20
+10
0
-10
SCREEN CURRENT (MILLIAMPERES)
300
250
200
150
100
50
0
50
100
150
200
250
300
PLATE VOLTAGE (VOLTS)

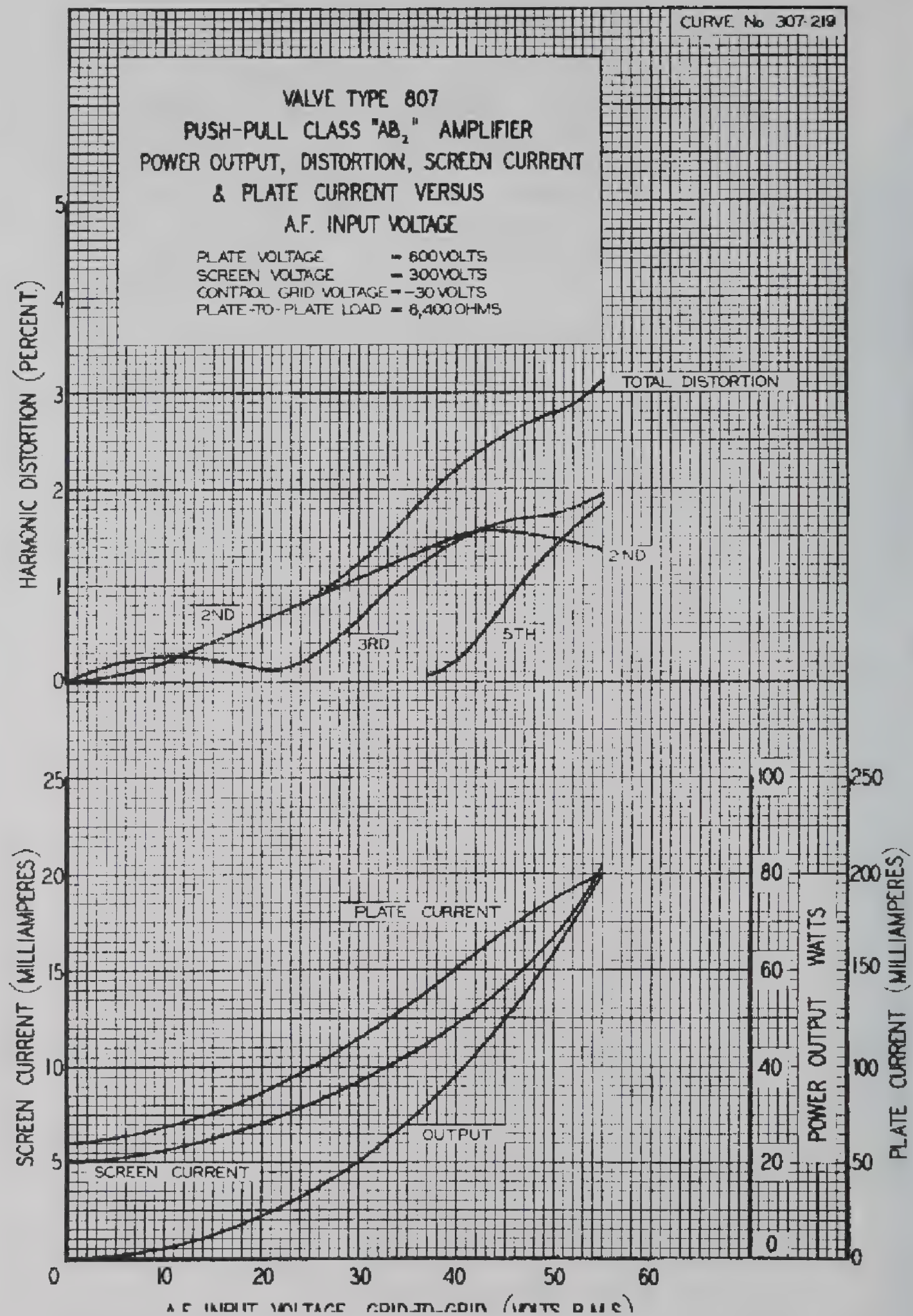

CURVE No 307-214
VALVE TYPE 807
SCREEN CURRENT VERSUS PLATE VOLTAGE
SCREEN VOLTAGE = 300 VOLTS
CONTROL GRID VOLTAGE = +30 VOLTS
+20
+10
0
-10
SCREEN CURRENT (MILLIAMPERES)
350
300
250
200
150
100
50
0
50
100
150
200
250
300
PLATE VOLTAGE (VOLTS)

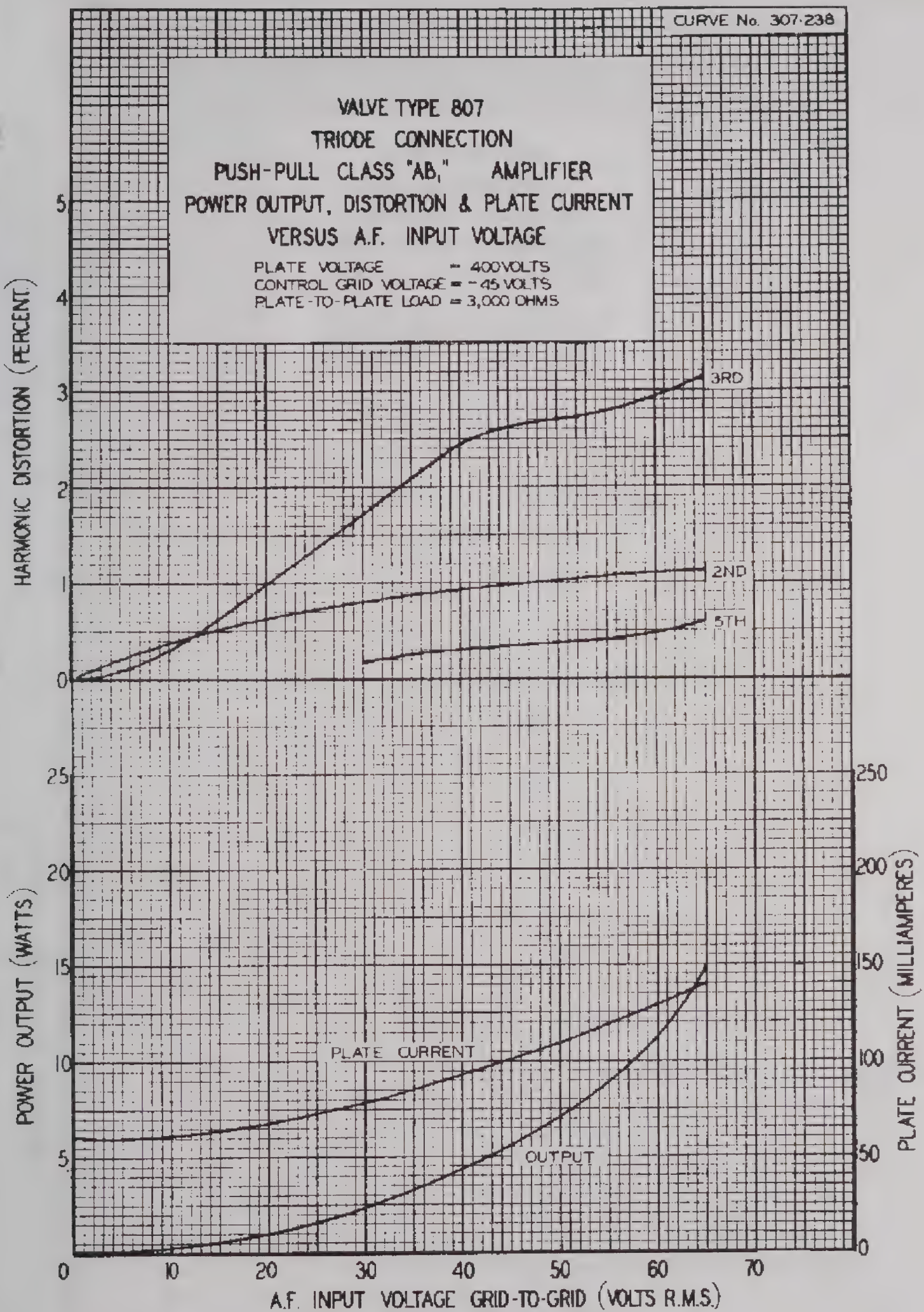

VALVE TYPE 807
CONTROL GRID CURRENT
VERSUS PLATE VOLTAGE
SCREEN VOLTAGE = 250 VOLTS
CONTROL GRID VOLTAGE = +30 VOLTS
+25
+20
+15
+10
+5
CONTROL GRID CURRENT (MILLIAMPERES)
PLATE VOLTAGE (VOLTS)
0
20
40
60
80
100
120
140
160
180
200
10
20
30
40
50
60
70
80
CURVE No. 307-215

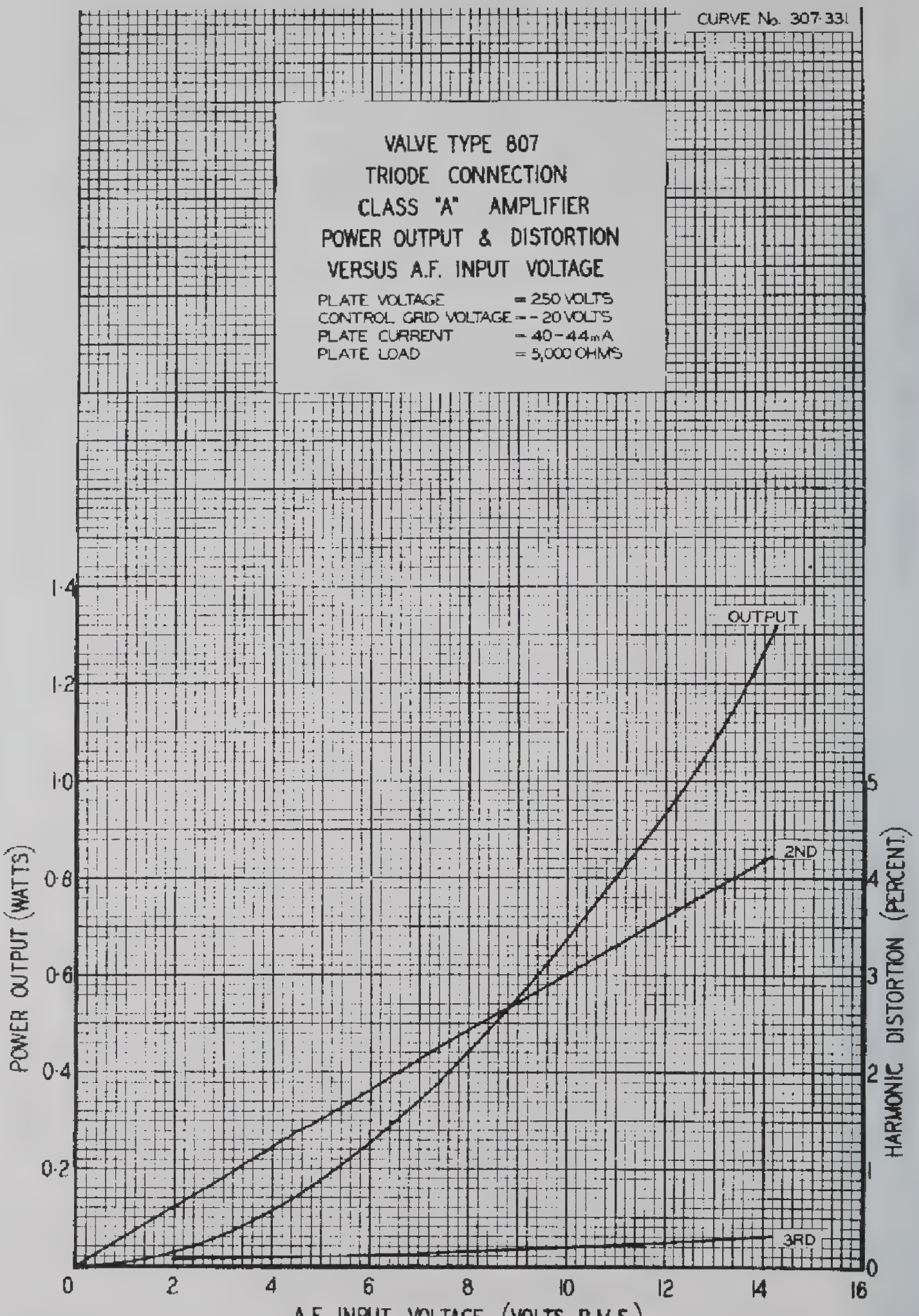

VALVE TYPE 807
CONTROL GRID CURRENT
VERSUS PLATE VOLTAGE
SCREEN VOLTAGE = 300VOLTS
CONTROL GRID VOLTAGE = +30VOLTS
+25
+20
+15
+10
+5
CONTROL GRID CURRENT (MILLIAMPERES)
PLATE VOLTAGE (VOLTS)
0
20
40
60
80
100
120
140
160
180
200
10
20
30
40
50
60
70
80
CURVE No. 307-216

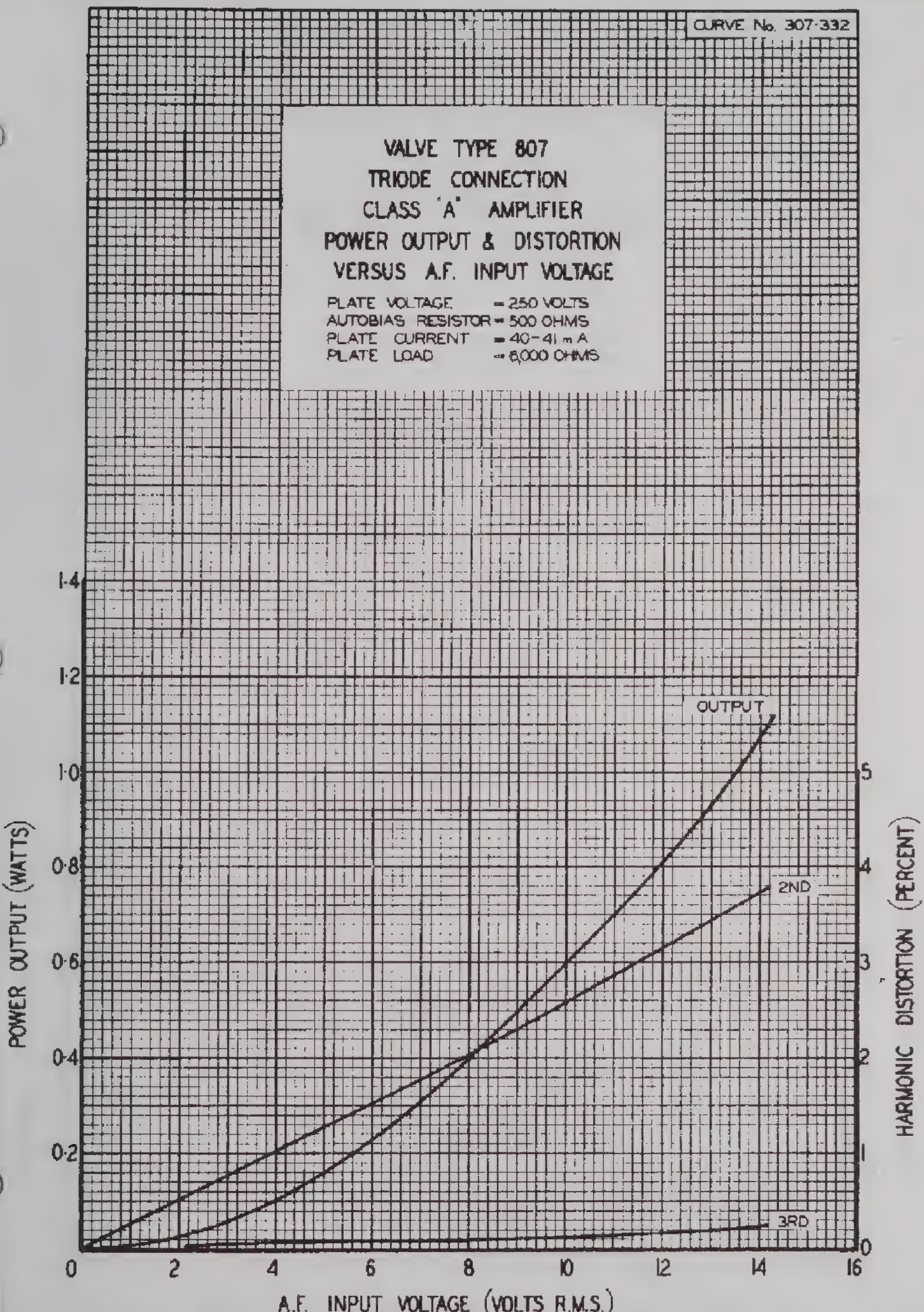

CURVE No. 307-217
VALVE TYPE 807
PUSH-PULL CLASS "AB2" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 400 VOLTS
SCREEN VOLTAGE = 300 VOLTS
CONTROL GRID VOLTAGE = -25 VOLTS
PLATE-TO-PLATE LOAD = 3,200 OHMS
3RD
7TH
2ND
5TH
PLATE CURRENT
SCREEN CURRENT
OUTPUT
HARMONIC DISTORTION (PERCENT)
SCREEN CURRENT (MILLIAMPERES)
POWER OUTPUT (WATTS)
PLATE CURRENT (MILLIAMPERES)
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)
0
10
20
30
40
50
60
1
2
3
4
5
15
25
80
100
150
200
250

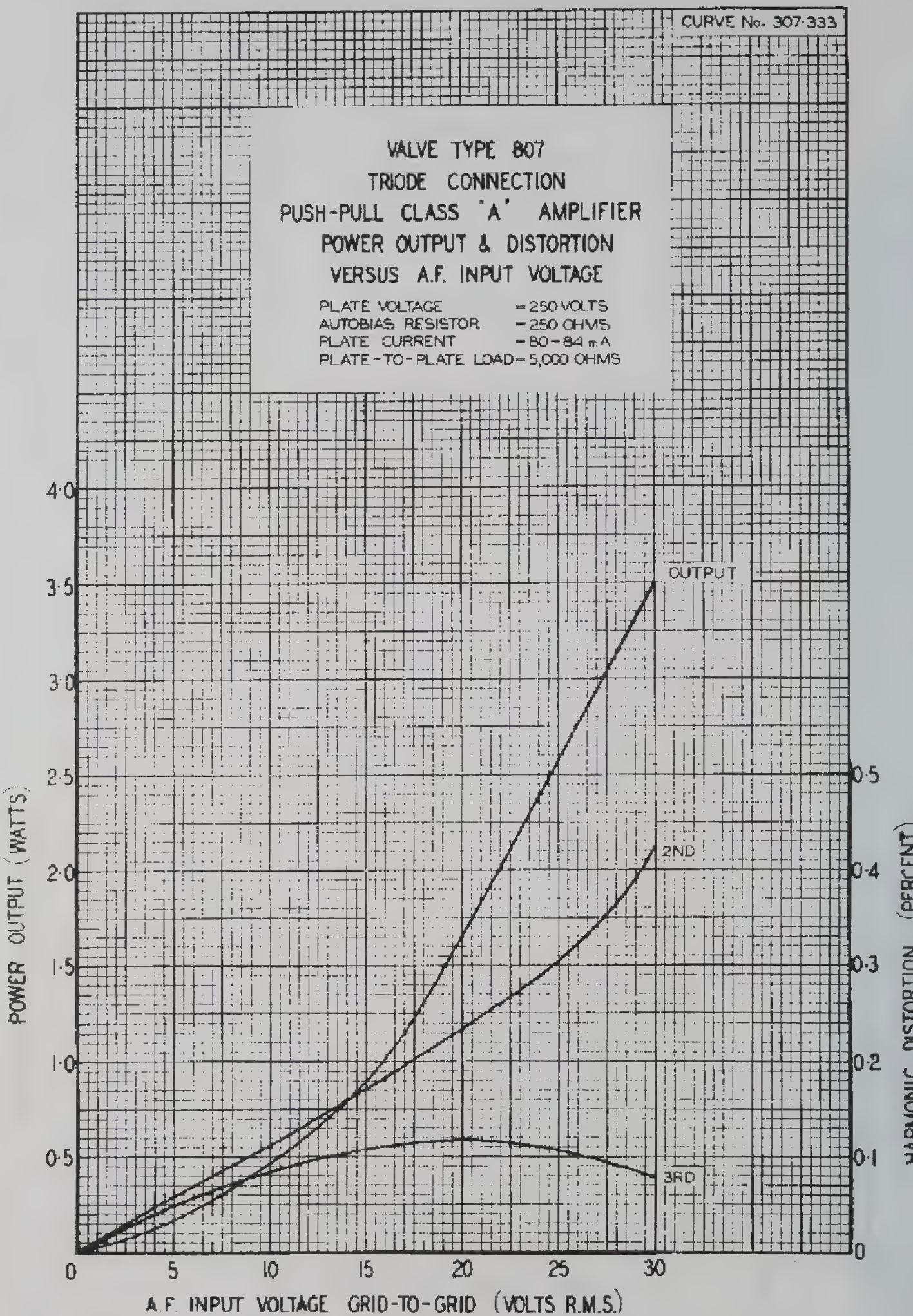

CURVE No. 307-218
VALVE TYPE 807
PUSH-PULL CLASS "AB2" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 500 VOLTS
SCREEN VOLTAGE = 300 VOLTS
CONTROL GRID VOLTAGE = -29 VOLTS
PLATE-TO-PLATE LOAD = 4,240 OHMS
HARMONIC DISTORTION (PERCENT.)
3RD
2ND
7TH
5TH
PLATE CURRENT
OUTPUT
SCREEN CURRENT
SCREEN CURRENT (MILLIAMPERES)
PLATE CURRENT (MILLIAMPERES)
POWER OUTPUT WATTS
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)

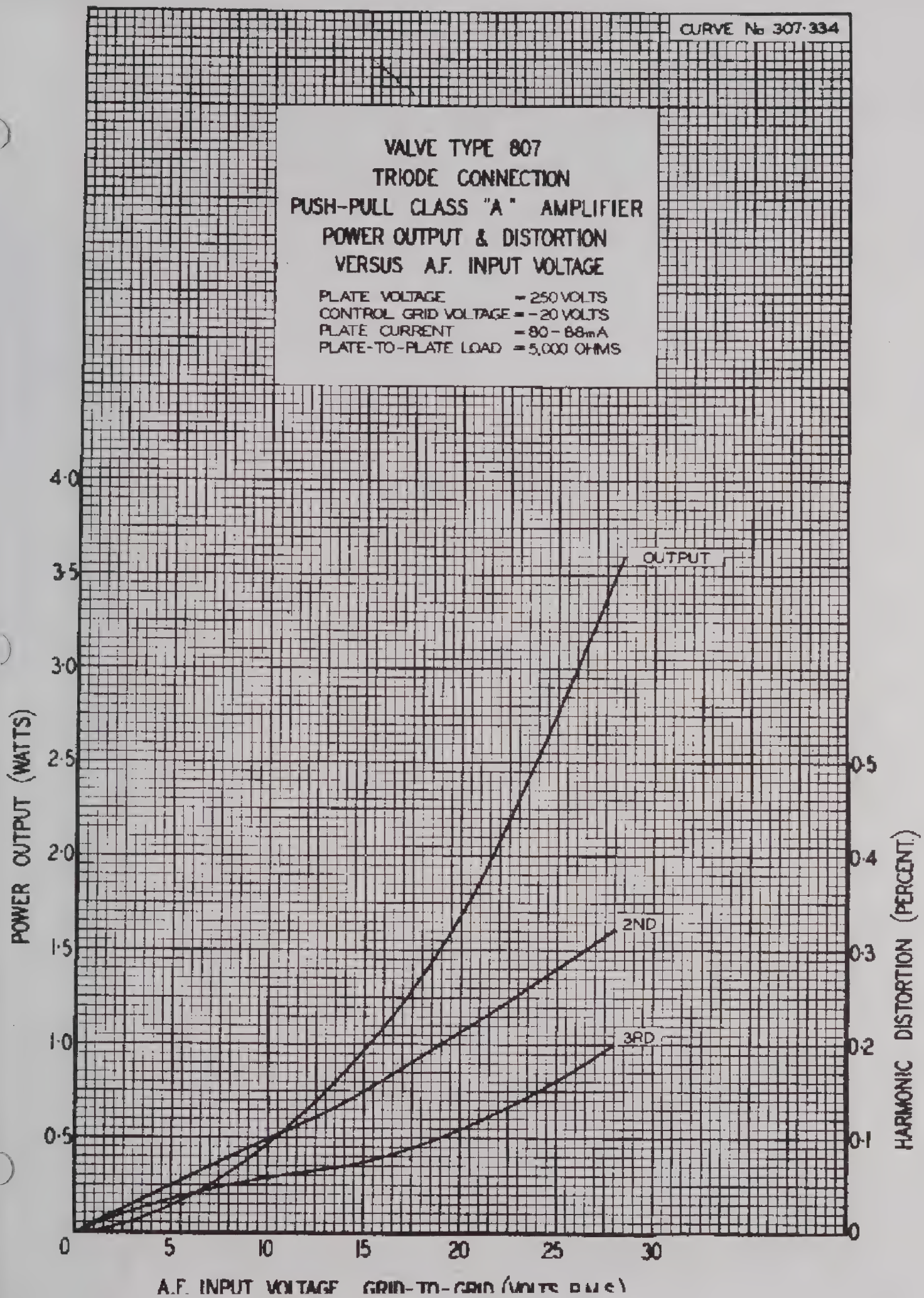

CURVE No 307-219
VALVE TYPE 807
PUSH-PULL CLASS "AB2" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 600 VOLTS
SCREEN VOLTAGE = 300 VOLTS
CONTROL GRID VOLTAGE = -30 VOLTS
PLATE-TO-PLATE LOAD = 6,400 OHMS
HARMONIC DISTORTION (PERCENT)
TOTAL DISTORTION
2ND
2ND
3RD
5TH
SCREEN CURRENT (MILLIAMPERES)
PLATE CURRENT
OUTPUT
SCREEN CURRENT
POWER OUTPUT WATTS
PLATE CURRENT (MILLIAMPERES)
A.F. INPUT VOLTAGE, GRID-TO-GRID (VOLTS R.M.S.)

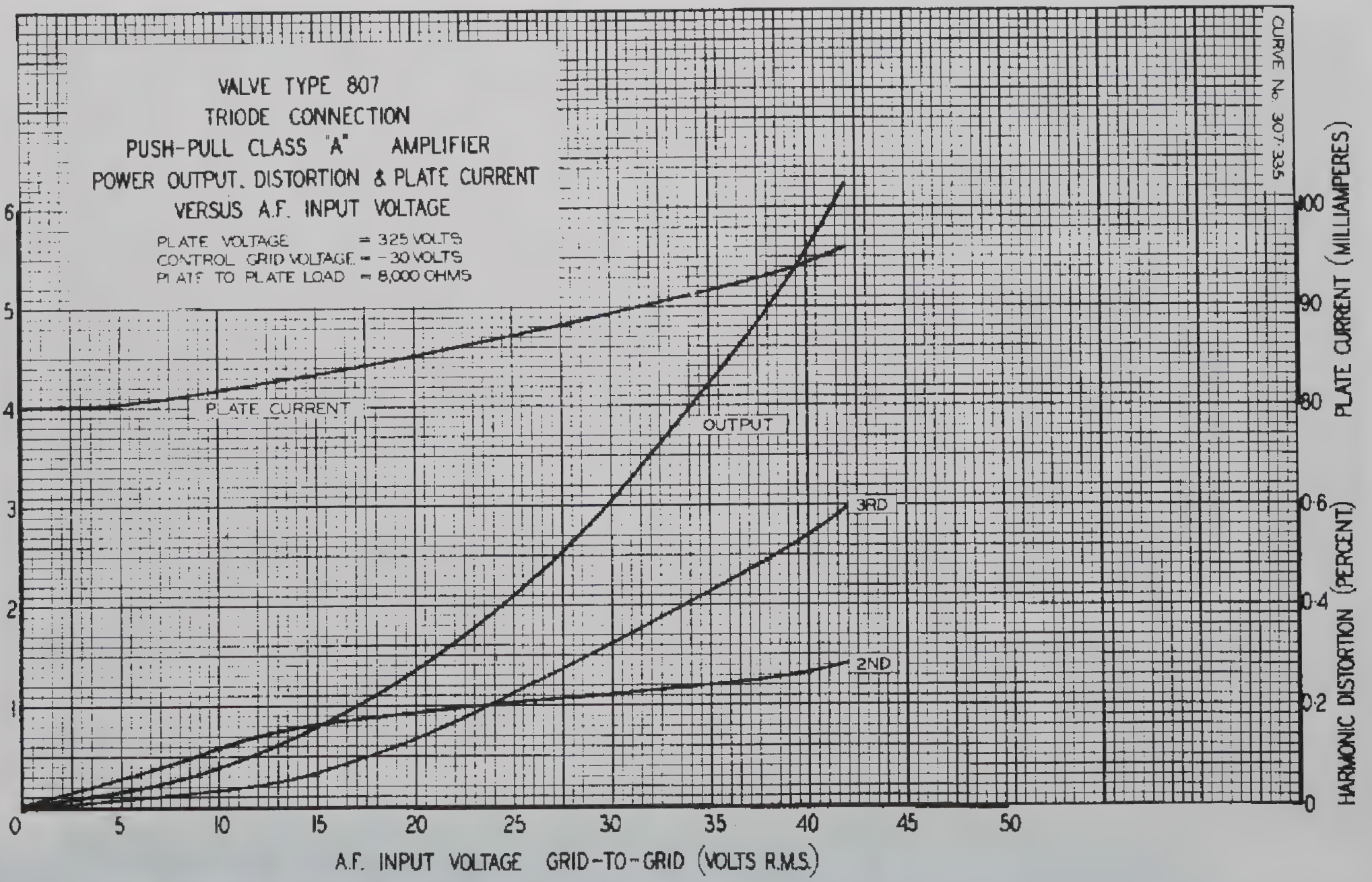

CURVE No. 307-238
VALVE TYPE 807
TRIODE CONNECTION
PUSH-PULL CLASS "AB," AMPLIFIER
POWER OUTPUT, DISTORTION & PLATE CURRENT
VERSUS A.F. INPUT VOLTAGE
PLATE VOLTAGE = 400 VOLTS
CONTROL GRID VOLTAGE = -45 VOLTS
PLATE-TO-PLATE LOAD = 3,000 OHMS
HARMONIC DISTORTION (PERCENT.)
3RD
2ND
5TH
PLATE CURRENT
OUTPUT
POWER OUTPUT (WATTS)
PLATE CURRENT (MILLIAMPERES)
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)

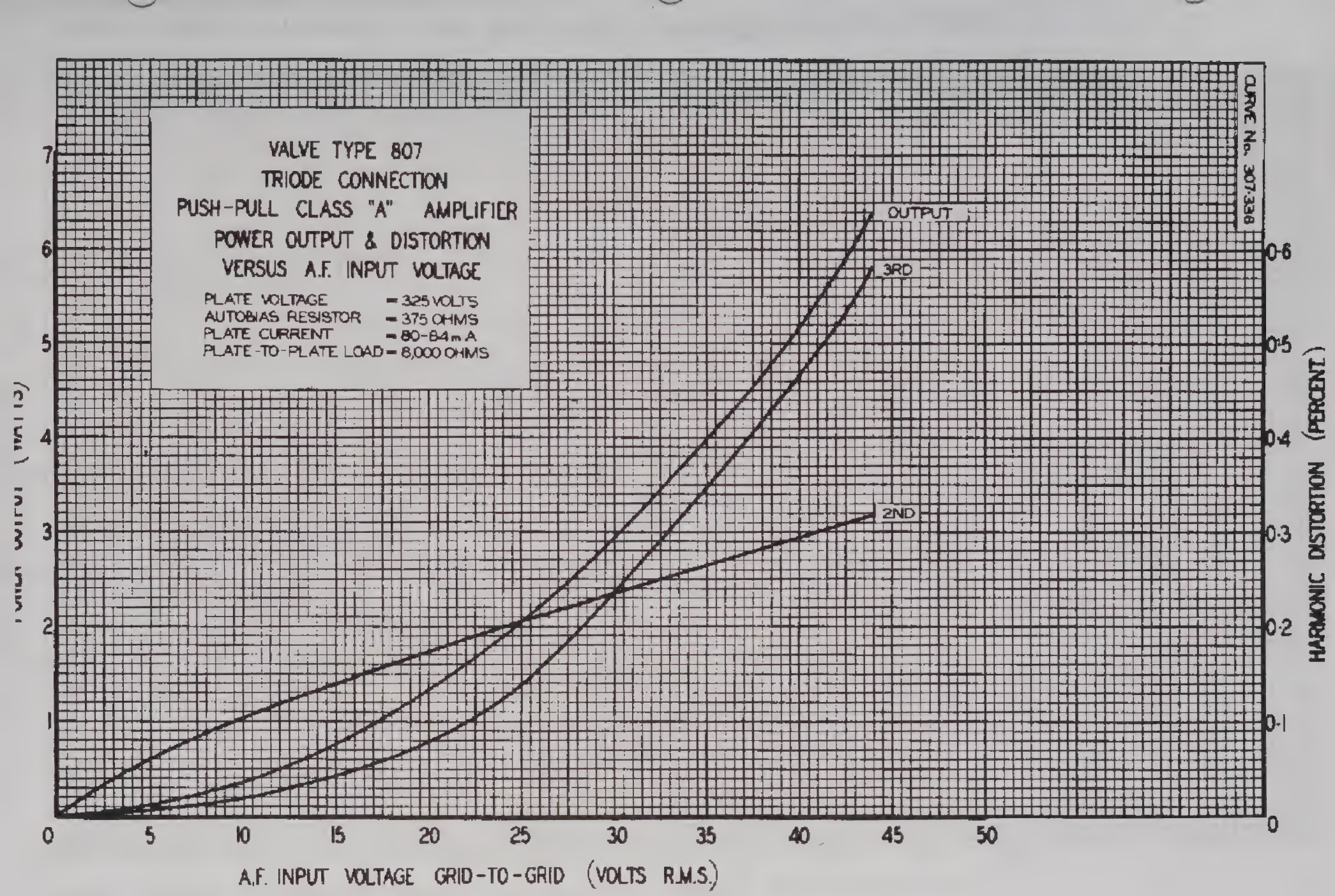

CURVE No. 307-331
VALVE TYPE 807
TRIODE CONNECTION
CLASS "A" AMPLIFIER
POWER OUTPUT & DISTORTION
VERSUS A.F. INPUT VOLTAGE
PLATE VOLTAGE = 250 VOLTS
CONTROL GRID VOLTAGE = -20 VOLTS
PLATE CURRENT = 40-44 mA
PLATE LOAD = 5,000 OHMS
OUTPUT
2ND
3RD
POWER OUTPUT (WATTS)
HARMONIC DISTORTION (PERCENT.)
A.F. INPUT VOLTAGE (VOLTS R.M.S.)
0
0·2
0·4
0·6
0·8
1·0
1·2
1·4
1
2
3
4
5
2
4
6
8
10
12
14
16

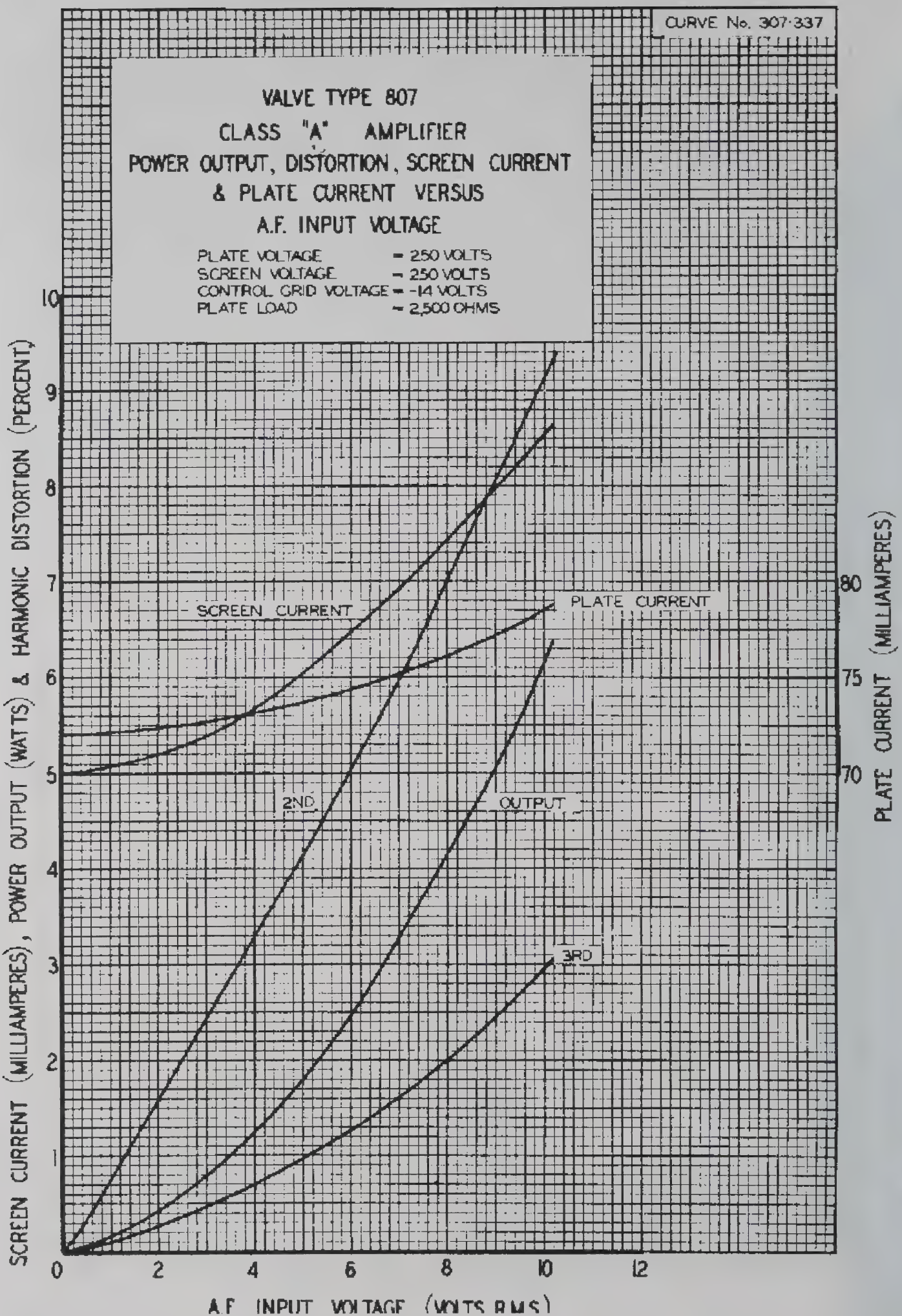

CURVE No. 307-332
VALVE TYPE 807
TRIODE CONNECTION
CLASS 'A' AMPLIFIER
POWER OUTPUT & DISTORTION
VERSUS A.F. INPUT VOLTAGE
PLATE VOLTAGE = 250 VOLTS
AUTOBIAS RESISTOR = 500 OHMS
PLATE CURRENT = 40-41 m A
PLATE LOAD = 6,000 OHMS
OUTPUT
2ND
3RD
POWER OUTPUT (WATTS)
HARMONIC DISTORTION (PERCENT)
A.F. INPUT VOLTAGE (VOLTS R.M.S.)
0
0·2
0·4
0·6
0·8
1·0
1·2
1·4
1
2
3
4
5
2
4
6
8
10
12
14
16

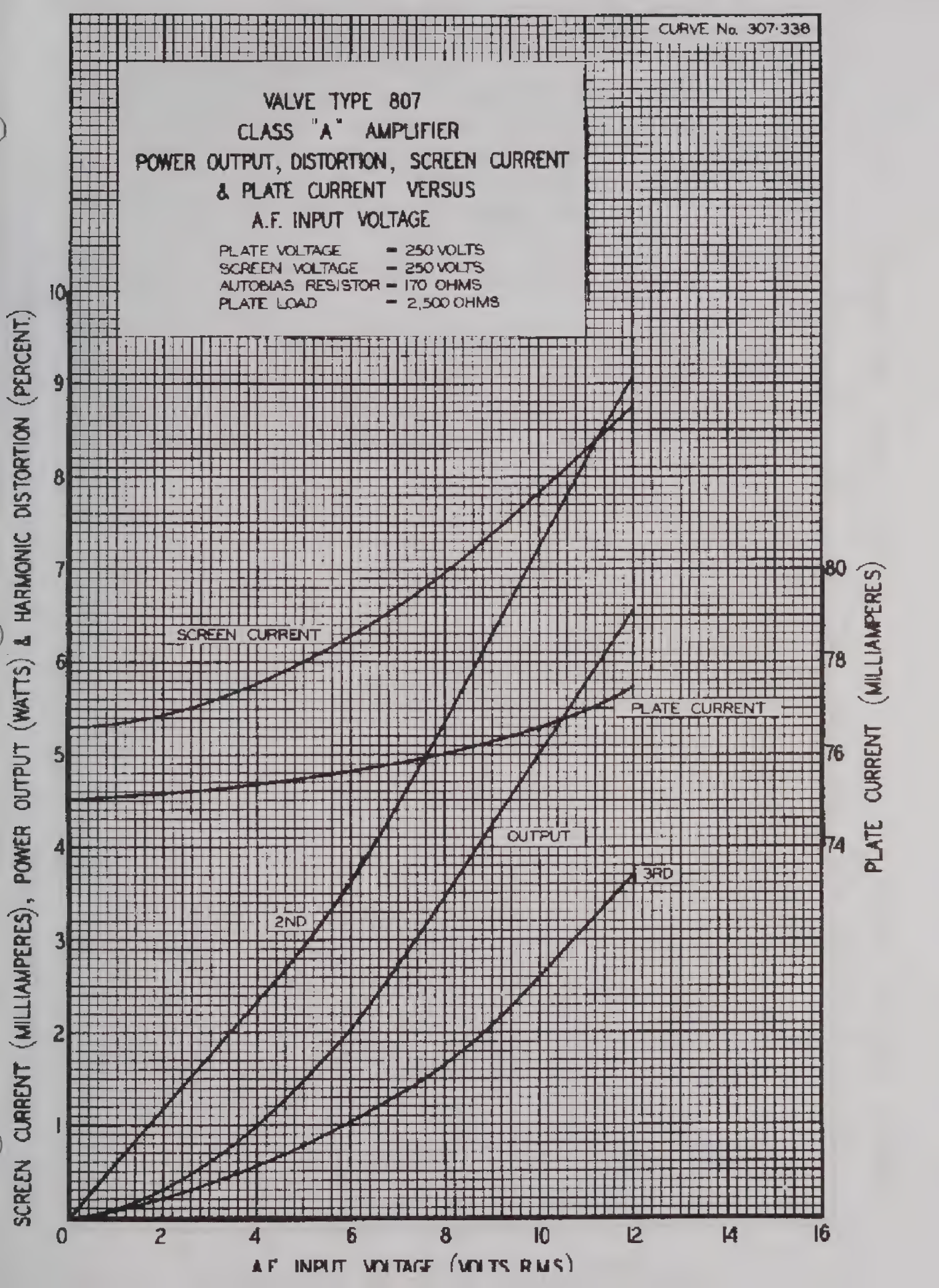

CURVE No. 307-333
VALVE TYPE 807
TRIODE CONNECTION
PUSH-PULL CLASS "A" AMPLIFIER
POWER OUTPUT & DISTORTION
VERSUS A.F. INPUT VOLTAGE
PLATE VOLTAGE = 250 VOLTS
AUTOBIAS RESISTOR = 250 OHMS
PLATE CURRENT = 80-84 m.A
PLATE-TO-PLATE LOAD = 5,000 OHMS
OUTPUT
2ND
3RD
POWER OUTPUT (WATTS)
HARMONIC DISTORTION (PERCENT)
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)
0
0·5
1·0
1·5
2·0
2·5
3·0
3·5
4·0
0·1
0·2
0·3
0·4
0·5
5
10
15
20
25
30

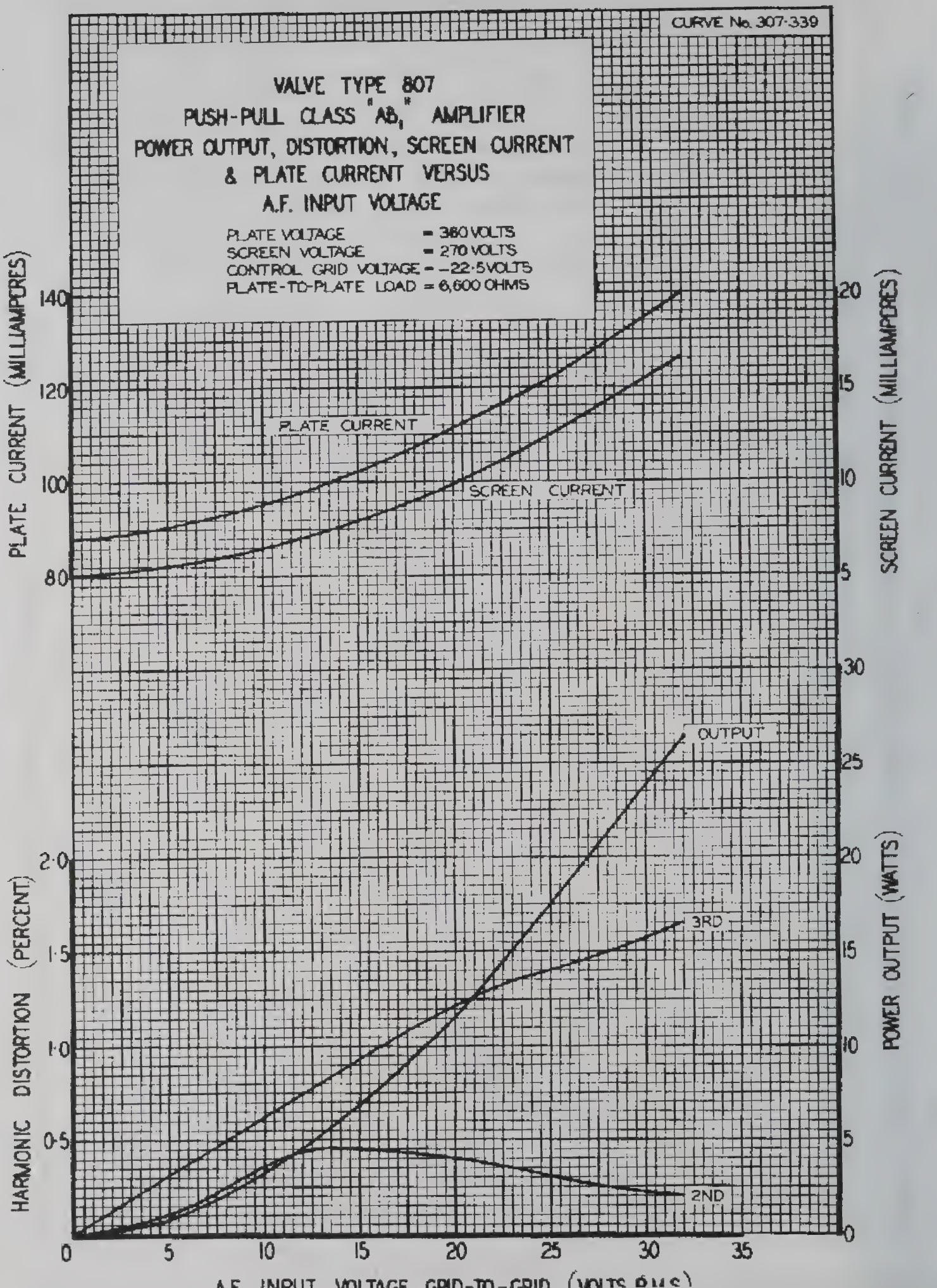

CURVE No 307·334
VALVE TYPE 807
TRIODE CONNECTION
PUSH-PULL CLASS "A" AMPLIFIER
POWER OUTPUT & DISTORTION
VERSUS A.F. INPUT VOLTAGE
PLATE VOLTAGE = 250 VOLTS
CONTROL GRID VOLTAGE = −20 VOLTS
PLATE CURRENT = 80 − 88 mA
PLATE-TO-PLATE LOAD = 5,000 OHMS
OUTPUT
2ND
3RD
POWER OUTPUT (WATTS)
HARMONIC DISTORTION (PERCENT.)
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)
0
0·5
1·0
1·5
2·0
2·5
3·0
3·5
4·0
0·1
0·2
0·3
0·4
0·5
5
10
15
20
25
30

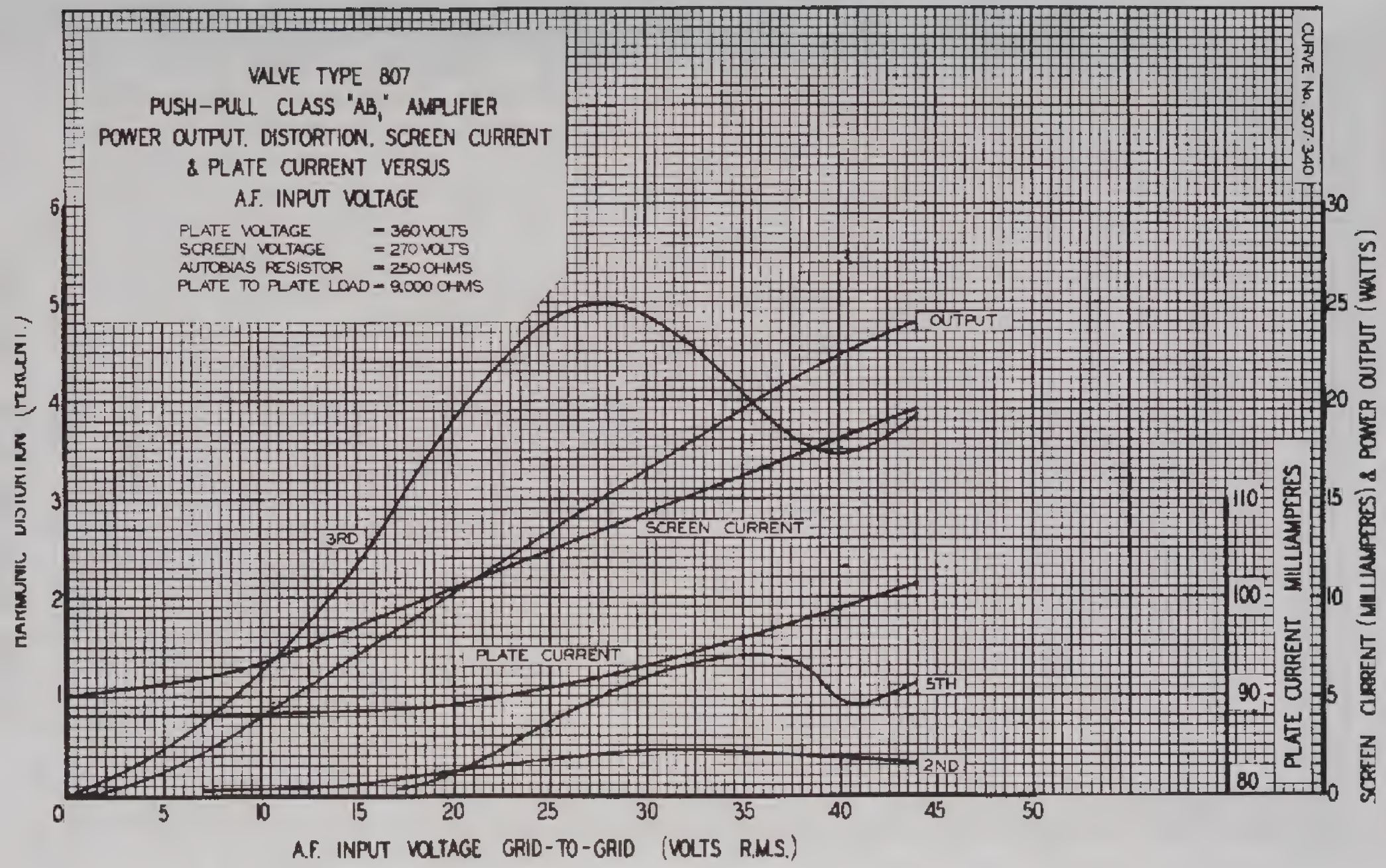

VALVE TYPE 807
TRIODE CONNECTION
PUSH-PULL CLASS "A" AMPLIFIER
POWER OUTPUT, DISTORTION & PLATE CURRENT
VERSUS A.F. INPUT VOLTAGE
PLATE VOLTAGE = 325 VOLTS
CONTROL GRID VOLTAGE = -30 VOLTS
PLATE TO PLATE LOAD = 8,000 OHMS
CURVE No. 307-335
PLATE CURRENT
OUTPUT
3RD
2ND
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40
45
50
0
0·2
0·4
0·6
80
90
100
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)
HARMONIC DISTORTION (PERCENT)
PLATE CURRENT (MILLIAMPERES)

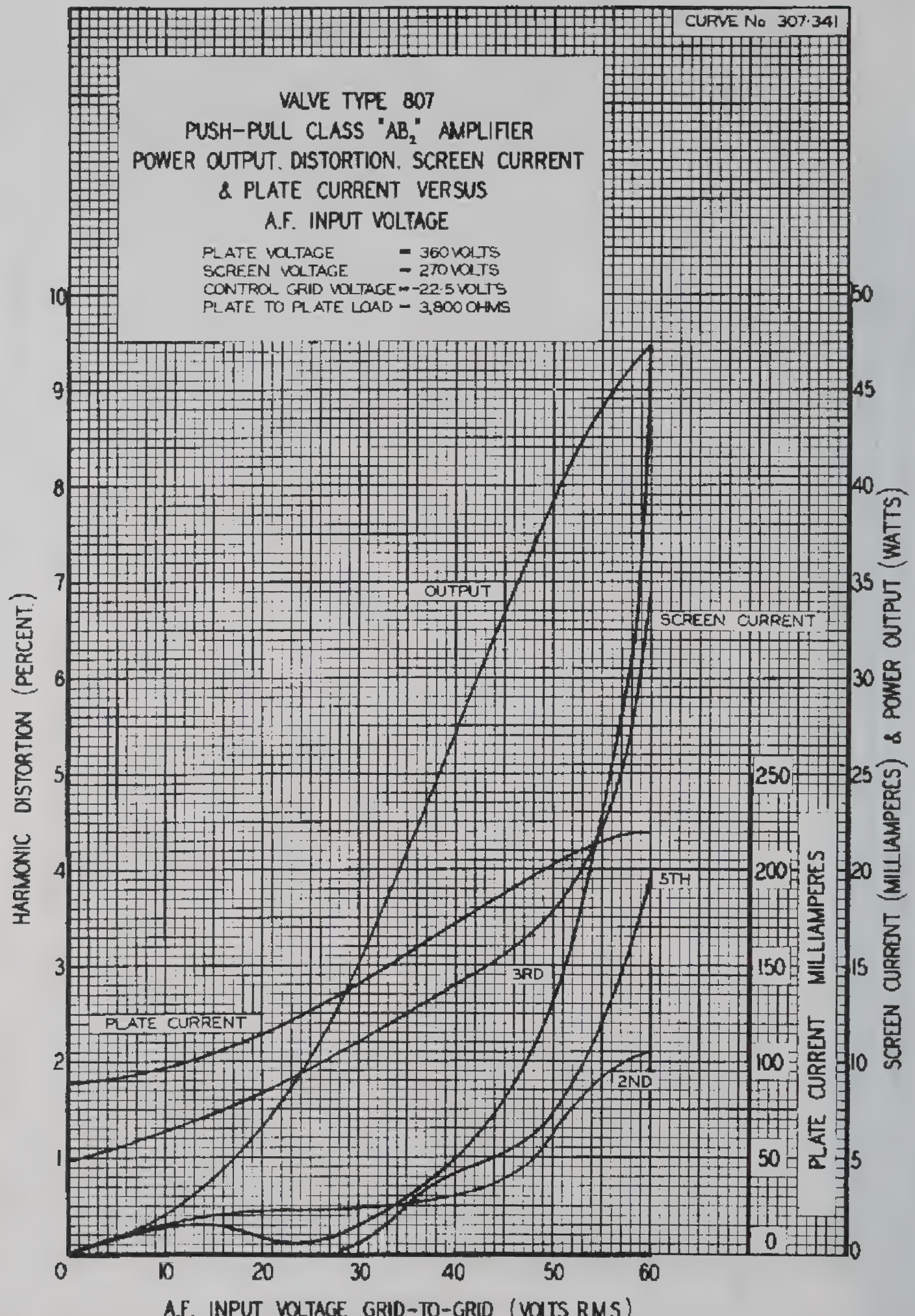

VALVE TYPE 807
TRIODE CONNECTION
PUSH-PULL CLASS "A" AMPLIFIER
POWER OUTPUT & DISTORTION
VERSUS A.F. INPUT VOLTAGE
PLATE VOLTAGE = 325 VOLTS
AUTOBIAS RESISTOR = 375 OHMS
PLATE CURRENT = 80-84 m.A.
PLATE-TO-PLATE LOAD = 8,000 OHMS
CURVE No. 307-338
OUTPUT
3RD
2ND
POWER OUTPUT (WATTS)
HARMONIC DISTORTION (PERCENT)
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)
0
1
2
3
4
5
6
7
0·1
0·2
0·3
0·4
0·5
0·6
5
10
15
20
25
30
35
40
45
50


CURVE No. 307-337
VALVE TYPE 807
CLASS "A" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 250 VOLTS
SCREEN VOLTAGE = 250 VOLTS
CONTROL GRID VOLTAGE = -14 VOLTS
PLATE LOAD = 2,500 OHMS
SCREEN CURRENT
PLATE CURRENT
2ND
OUTPUT
3RD
SCREEN CURRENT (MILLIAMPERES), POWER OUTPUT (WATTS) & HARMONIC DISTORTION (PERCENT)
PLATE CURRENT (MILLIAMPERES)
A.F. INPUT VOLTAGE (VOLTS R.M.S.)
0
2
4
6
8
10
12
1
2
3
4
5
6
7
8
9
10
70
75
80


CURVE No. 307-338
VALVE TYPE 807
CLASS "A" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 250 VOLTS
SCREEN VOLTAGE = 250 VOLTS
AUTOBIAS RESISTOR = 170 OHMS
PLATE LOAD = 2,500 OHMS
SCREEN CURRENT
PLATE CURRENT
OUTPUT
2ND
3RD
SCREEN CURRENT (MILLIAMPERES), POWER OUTPUT (WATTS) & HARMONIC DISTORTION (PERCENT.)
PLATE CURRENT (MILLIAMPERES)
A.F. INPUT VOLTAGE (VOLTS R.M.S.)
0
2
4
6
8
10
12
14
16
1
2
3
4
5
6
7
8
9
10
74
76
78
80


CURVE No. 307-339
VALVE TYPE 807
PUSH-PULL CLASS "AB1" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 360 VOLTS
SCREEN VOLTAGE = 270 VOLTS
CONTROL GRID VOLTAGE = -22·5 VOLTS
PLATE-TO-PLATE LOAD = 6,600 OHMS
PLATE CURRENT
SCREEN CURRENT
OUTPUT
3RD
2ND
PLATE CURRENT (MILLIAMPERES)
SCREEN CURRENT (MILLIAMPERES)
HARMONIC DISTORTION (PERCENT)
POWER OUTPUT (WATTS)
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)
140
120
100
80
20
15
10
5
2·0
1·5
1·0
0·5
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35


VALVE TYPE 807
PUSH-PULL CLASS "AB1" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 360 VOLTS
SCREEN VOLTAGE = 270 VOLTS
AUTOBIAS RESISTOR = 250 OHMS
PLATE TO PLATE LOAD = 9,000 OHMS
CURVE No. 307-340
OUTPUT
SCREEN CURRENT
PLATE CURRENT
3RD
5TH
2ND
HARMONIC DISTORTION (PERCENT.)
SCREEN CURRENT (MILLIAMPERES) & POWER OUTPUT (WATTS)
PLATE CURRENT MILLIAMPERES
110
100
90
80
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40
45
50
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)


CURVE No 307-341
VALVE TYPE 807
PUSH-PULL CLASS "AB2" AMPLIFIER
POWER OUTPUT, DISTORTION, SCREEN CURRENT
& PLATE CURRENT VERSUS
A.F. INPUT VOLTAGE
PLATE VOLTAGE = 360 VOLTS
SCREEN VOLTAGE = 270 VOLTS
CONTROL GRID VOLTAGE = -22·5 VOLTS
PLATE TO PLATE LOAD = 3,800 OHMS
OUTPUT
SCREEN CURRENT
5TH
3RD
2ND
PLATE CURRENT
HARMONIC DISTORTION (PERCENT.)
SCREEN CURRENT (MILLIAMPERES) & POWER OUTPUT (WATTS)
PLATE CURRENT MILLIAMPERES
A.F. INPUT VOLTAGE GRID-TO-GRID (VOLTS R.M.S.)
0
10
20
30
40
50
60
1
2
3
4
5
6
7
8
9
10
0
5
10
15
20
25
30
35
40
45
50
0
50
100
150
200
250

MIL-E-1/99C
11 August 1970
SUPERSEDING
MIL-E-1/99B
26 March 1963

MILITARY SPECIFICATION SHEET

ELECTRON TUBES, TRANSMITTING

TYPES 807 AND 1625 1/

The complete requirements for procuring the electron tubes described herein shall consist of this document and the latest issue of MIL-E-1.

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

DESCRIPTION: Amplifier, beam power. F1 = 60 MHz. F2 = 125 MHz

Outline --- 16-2 (EIA)

Base
807 --- A5-11 (low-loss phenolic)
1625 --- A7-13 (low-loss phenolic)

Cap --- C1-1

Envelope --- ST16

Cathode --- Coated unipotential

Base connections:

Pin No.	---	1	2	3	4	5	6	7	Cap
Element									
807	---	h	g2	g1	k, g3 (Note 2)	h	---	---	a
1625	---	h	nc	g2	g1	nc	k, g3 (Note 2)	h	a

ABSOLUTE-MAXIMUM RATINGS:

Parameter:	Ef	Eb	Ec1	Ec2	Ib	Ic1	Pg2	Pp	Pi	© Ehk	Modulation	Alt
Unit:	V	Vdc	Vdc	Vdc	mAdc	mAdc	W	W	W	V	---	ft
Type 807												
Class B AF:	6.3 ±10%	600	---	300	120	---	3.5	25	60	135	---	10,000
Class B RF:	6.3 ±10%	600	---	300	80	---	2.5	25	37.5	135	---	10,000
Class C Telep:	6.3 ±10%	475	-200	300	83	5	2.5	16.5	40	135	Anode	10,000
Class C Teleg:	6.3 ±10%	600	-200	300	100	5	3.5	25	60	135	---	10,000
TEST CONDITIONS:	6.3	600	-29	300	---	---	---	---	---	---	---	---
Type 1625												
Class B AF:	12.6 ±10%	600	---	300	120	---	3.5	25	60	135	---	10,000
Class B RF:	12.6 ±10%	600	---	300	80	---	2.5	25	37.5	135	---	10,000
Class C Telep:	12.6 ±10%	475	-200	300	83	5	2.5	16.5	40	135	Anode	10,000
Class C Teleg:	12.6 ±10%	600	-200	300	100	5	3.5	25	60	135	---	10,000
TEST CONDITIONS:	12.6 Vdc	600	-29	300	---	---	---	---	---	---	---	---

GENERAL:

Qualification - Required

1/ See note 1

© denotes changes

METHOD	REQUIREMENT OR TEST	CONDITIONS	AQL (PERCENT DEFECTIVE)	INSPECTION LEVEL OR CODE	SYMBOL	LIMITS MIN	LIMITS MAX	UNIT
	Qualification inspection							
1236	Power oscillation (2)	Power oscillation (1): F = 60 MHz	---	---	Po	28	---	W
	Quality conformance inspection, part 1		Ⓒ					
1231	Emission	Eb = Ec1 = Ec2 = 50 Vdc (see note 3)	0.65	II	Is	300	---	mAdc
1236	Power oscillation (1)	Ec2 = 200 Vdc: Rg = 10,000 ohms: Ic1 = 6 mAdc: Ib = 100 mAdc: F = 15 MHz	0.65	II	Po	33	---	W
1256	Electrode current (1) (anode)		0.65	II	Ib	24	48	mAdc
1266	Total grid current	See note 3	0.65	II	Ic	---	-4.0	µAdc
Ⓒ 1201	Short and discontinuity detection		0.4	II	---	---	---	---
	Quality conformance inspection, part 2							
1031	Low frequency vibration	Eb = 250 Vdc: Ec2 = 100 Vdc: Ec1 = -10 Vdc: Rp = 2,000 ohms	---	---	Fp	---	500	mVac
1036	Bump	Hammer angle = 20°	---	---	---	---	---	---
1301	Heater current							
	Type 807		---	---	If	810	990	mA
	Type 1625		---	---	If	405	495	mA
Ⓒ 1336	Heater-cathode leakage		---	---	Ihk	---	100	µAdc
Ⓒ 1256	Electrode current (2) (anode)	Ec1 = -100 Vdc	---	---	Ib	---	0.5	mAdc
Ⓒ 1256	Electrode current (screen)		---	---	Ic2	0	4.0	mAdc
1266	Primary grid emission Type 807	Ec2 = 175 Vdc (approx): Eb = Ec2 = 0: Ec1 = 0 to 6 Vdc: Pg2 = 5 W (see note 4)	---	---	Ic2	---	-750	µAdc
1306	Transconductance Type 1625	Eb = Ec2 = 250 Vdc: Ec1 = -14 Vdc	---	---	Sm	5,100	6,900	µmhos
1236	Internal insulation		---	---	---	---	---	---
1331	Direct-interelectrode capacitance	Shield No. 312	---	---	Cgp	---	0.2	pF
		Without shield			Cin	10.0	14.0	pF
		Without shield			Cout	5.3	8.7	pF
Ⓒ 1216	Base material insulating quality		---	---	---	---	---	---

METHOD	REQUIREMENT OR TEST	CONDITIONS	AQL (PERCENT) EFFECTIVE	INSPECTION LEVEL OR CLASS	SYMBOL	LIMITS MIN	LIMITS MAX	UNIT
	Quality conformance inspection, part 2 -Continued							
Ⓒ 1101	Secureness of base, cap, or insert		---	---	---	---	---	---
Ⓒ 1105	Permanence of marking		---	---	---	---	---	---
	Quality conformance inspection, part 3							
---	Life-test provisions	Group B: Ehk = 135 V	---	---	---	---	---	---
---	Life-test end points (500 hours)	Total grid current and	---	---	Ic1	0	-4.0	μAdc
		Power oscillation (1)	---	---	Po	27	---	W

NOTES:

1. Tube type 5933 has been deleted from this tube specification sheet. For replacement purposes use tube type 5933WA, MIL-E-1/652.
2. The beam forming plate lead and the cathode lead shall be individually passed through the glass stem of the tube and shall be electrically connected together only at the base pin.
3. This test to be performed at the conclusion of the holding period.
4. A protective resistor of 15,000 ohms shall be placed in series with the primary emission current meter. Grid No. 2 input power shall be calculated as 2.40 times the product of the rectified current and rectified voltage. Test duration shall be sufficient to obtain a stabilized negative Ic2 value.

Custodians:
Army - EL
Navy - EC
Air Force - 80

Review activities:
Army - EL
Navy -
Air Force - 11, 80
DSA - ES

User activities:
Army - MU, WC
Navy - AS, OS, MC, CG, SH
Air Force - 19

Preparing activity: Navy - EC

Agent: DSA - ES

(Project 5960-2425-52)

RCA

7199

7199

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

9-PIN MINIATURE TYPE

For high-fidelity audio-amplifier applications critical as to noise and hum

GENERAL DATA

Electrical:

Heater, for Unipotential Cathodes:

Voltage	6.3 ± 10%	ac or dc volts
Current	0.45	amp

Direct Interelectrode Capacitances:°

Triode Unit:		
Grid to plate	2	μμf
Grid to cathode and heater	2.3	μμf
Plate to cathode and heater	0.3	μμf
Pentode Unit:		
Grid No.1 to plate	0.06 max.	μμf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater	5	μμf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater	2	μμf

Equivalent-Hum and Noise Voltage (Referenced to Grid):

Triode Unit

Median Value (RMS)	10	microvolts
Maximum Value (RMS)	150	microvolts

Measured in "true rms" units under the following conditions: heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate load resistor (megohms) = 0.1, cathode resistor (ohms) = 1500, grid resistor (megohms) = 0.05, and amplifier covering frequency range between 25 and 10,000 cps.

Pentode Unit

Median Value (RMS)	35	microvolts
Maximum Value (RMS)	100	microvolts

Measured in "true rms" units under the following conditions: heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate-load resistor (megohms) = 0.1, grid-No.2 supply volts = 250, grid-No.2 resistor (megohms) = 0.33, grid-No.2-bypass capacitor (μf) = 0.22, cathode resistor (ohms) = 1200, grid-No.1 resistor (megohms) = 0.05, and amplifier covering frequency range between 25 and 10,000 cps.

Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate-Supply Voltage	215	100	220	volts

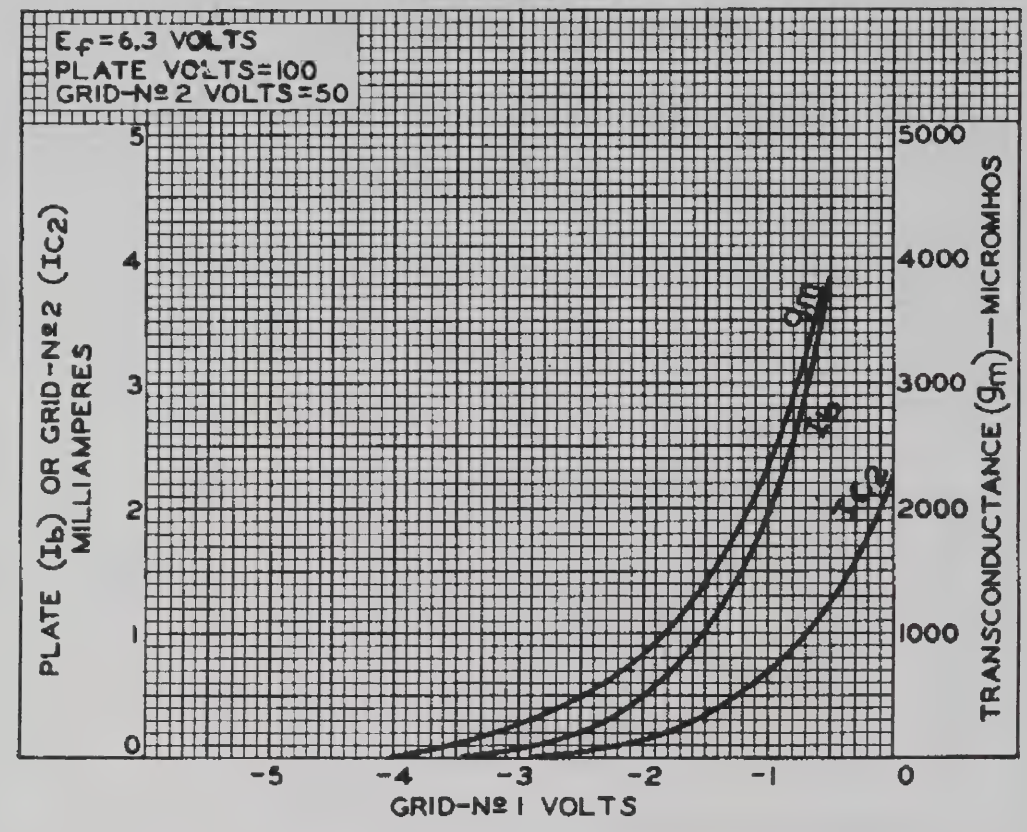
°: See next page.

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

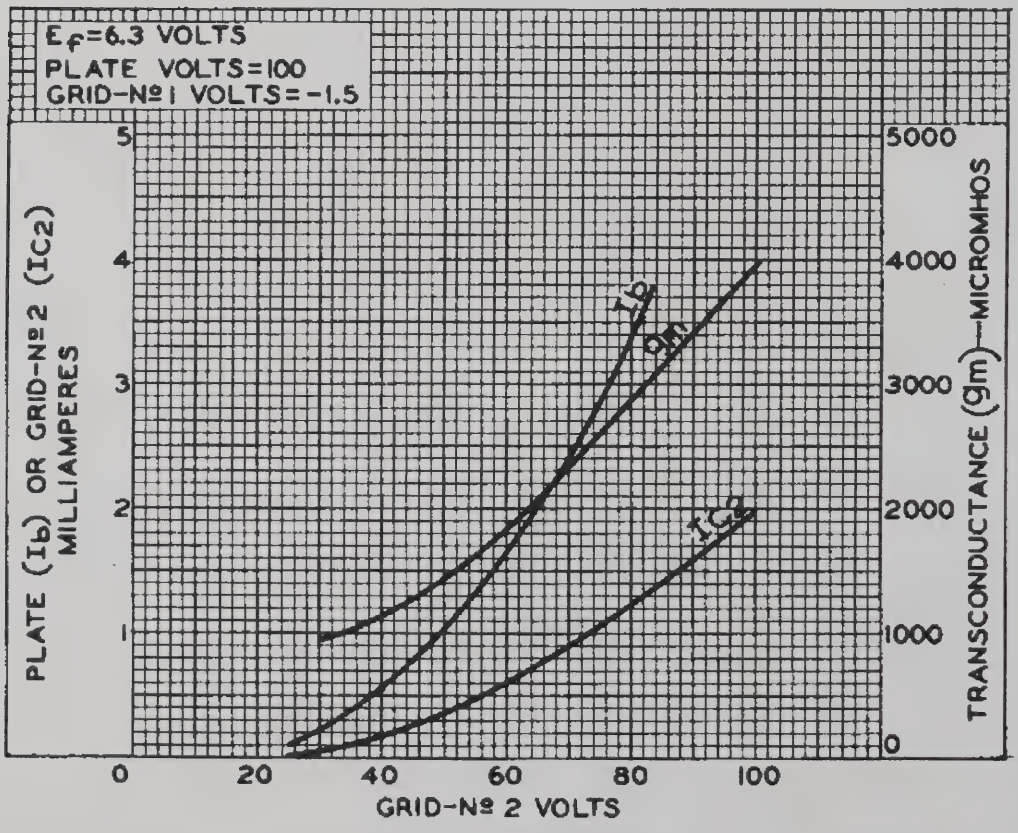
RCA

7199

AVERAGE CHARACTERISTICS
PENTODE UNIT



92CS-9702



ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CS-9703

7199

7199

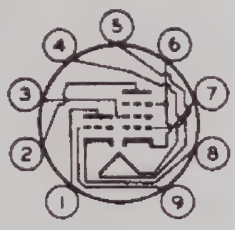
MEDIUM-MU TRIODE— SHARP-CUTOFF PENTODE

	Triode Unit	*Pentode Unit*		
Grid-No.2 Supply voltage	–	50	130	volts
Grid-No.1 Voltage	-8.5	–	–	volts
Cathode Resistor	–	1000	62	ohms
Amplification Factor	17	–	–	
Plate Resistance (Approx.)	0.0081	1	0.4	megohm
Transconductance	2100	1500	7000	μmhos
Plate Current	9	1.1	12.5	ma
Grid-No.2 Current	–	0.35	3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-40	-4	–	volts

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
Diameter	0.750" to 0.875"
Dimensional Outline	*See General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9JT

Pin 1 – Triode Plate
Pin 2 – Pentode Plate
Pin 3 – Pentode Grid No.2
Pin 4 – Heater
Pin 5 – Heater



Pin 6 – Pentode Cathode, Grid No.3, Internal Shield
Pin 7 – Pentode Grid No.1
Pin 8 – Triode Cathode
Pin 9 – Triode Grid

AMPLIFIER — Class A_1

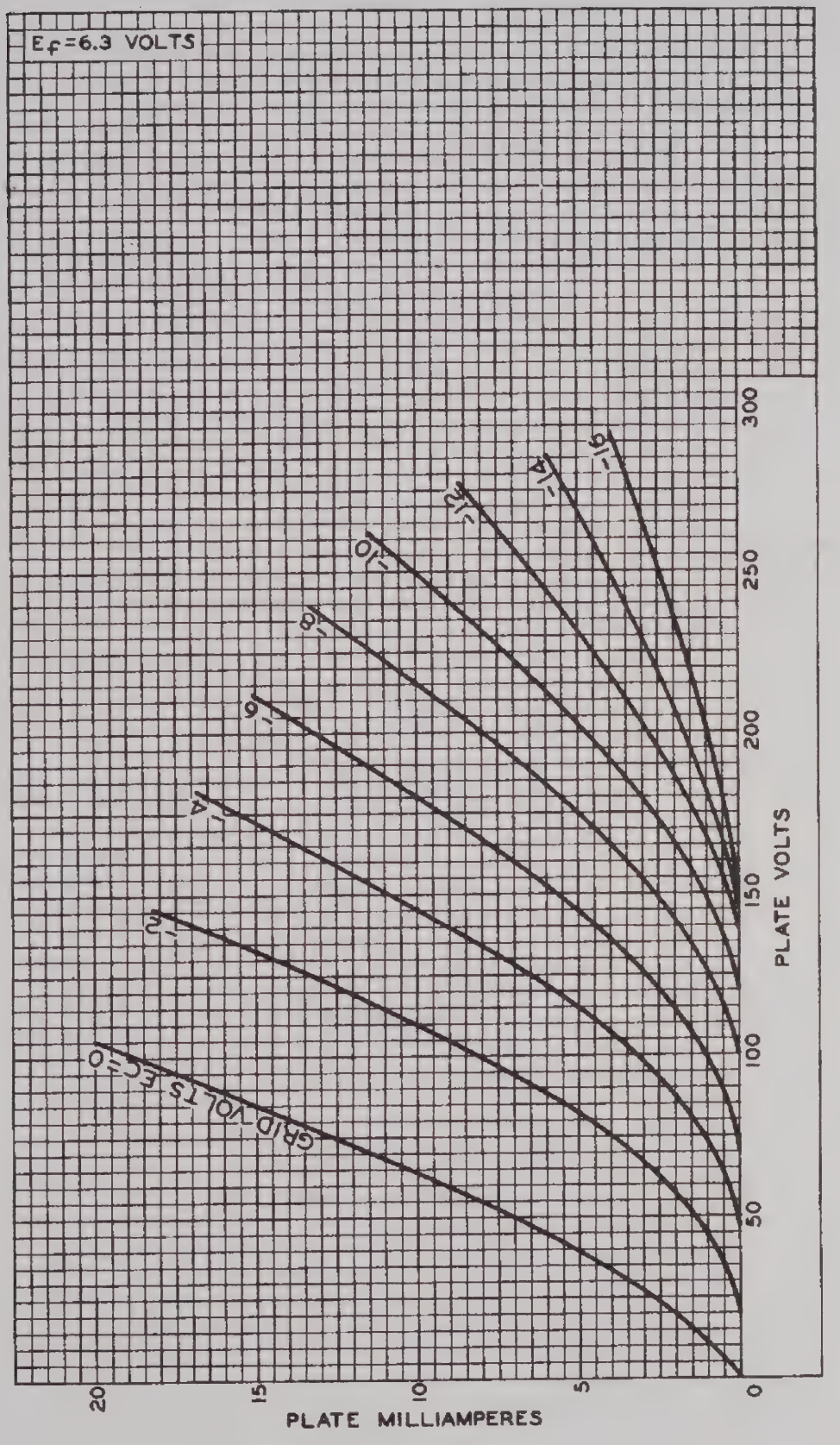
Maximum Ratings, *Design-Maximum Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	–	330 max.	volts
GRID-No.2 VOLTAGE	–	*See Grid-No.2 Input Rating Chart at front of Receiving Tube Section*	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value	0 max.	0 max.	volts

°: See next page.

7199

AVERAGE PLATE CHARACTERISTICS
Triode Unit



92CM-9693

	Triode Unit	*Pentode Unit*	
GRID-No.2 INPUT:			
For grid-No.2 voltages up to 165 volts	–	0.6 max.	watt
For grid-No.2 voltages between 165 and 330 volts	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
PLATE DISSIPATION	2.4 max.	3 max.	watts

Maximum Circuit Values:

	Triode Unit	*Pentode Unit*	
Grid-No.1-Circuit Resistance:[c]			
For fixed-bias operation	0.5 max.	0.25 max.	megohm
For cathode-bias operation	1 max.	1 max.	megohm

[a] The dc component must not exceed 100 volts.

[b] Without external shield.

[c] If either unit is operated at maximum rated conditions, grid-No.1-circuit resistances for both units should not exceed the stated values.

pacitor (μf) from grid No.2 to cathode = 0.1; cathode resistor (ohms unbypassed) = 680; grid No.1 resistor (megohm) = 0.27; and amplifier covering frequency range between 25 and 10,000 cps.

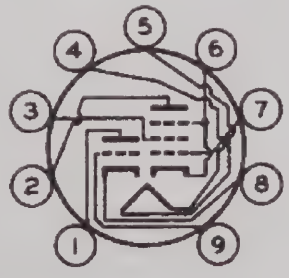
Characteristics, Class A_1 Amplifier:

	Triode Unit	*Pentode Unit*		
Plate-Supply Voltage	215	100	220	volts
Grid-No.2 Supply Voltage	–	50	130	volts
Grid-No.1 Voltage	-8.5	–	–	volts
Cathode Resistor	–	1000	62	ohms
Amplification Factor	17	–	–	
Plate Resistance (Approx.)	0.0081	1	0.4	megohm
Transconductance	2100	1500	7000	μmhos
Plate Current	9	1.1	12.5	ma
Grid-No.2 Current	–	0.35	3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 10	-40	-4	–	volts

Mechanical:

Operating Position . . . . . Any
Type of Cathodes . . . . . Coated Unipotential
Maximum Overall Length . . . . . 2-3/16"
Maximum Seated Length . . . . . 1-15/16"
Length, Base Seat to Bulb Top (Excluding tip) . . 1-9/16" ± 3/32"
Diameter . . . . . 0.750" to 0.875"
Dimensional Outline . . . . . See *General Section*
Bulb T6-1/2
Base . . . . . Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW 9JT

Pin 1 – Triode Plate
Pin 2 – Pentode Plate
Pin 3 – Pentode Grid No.2
Pin 4 – Heater
Pin 5 – Heater



Pin 6 – Pentode Cathode, Grid No.3, Internal Shield
Pin 7 – Pentode Grid No.1
Pin 8 – Triode Cathode
Pin 9 – Triode Grid

AMPLIFIER — Class A_1

Maximum Ratings, *Design-Maximum Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	–	330 max.	volts
GRID-No.2 VOLTAGE	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value	0 max.	0 max.	volts

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

For High-Fidelity Audio-Amplifier Applications Critical as to Noise and Hum

GENERAL DATA

Electrical:

Heater Characteristics and Ratings:			
Voltage (AC or DC)	6.3 ± 0.6		volts
Current at heater volts = 6.3	0.450		amp
Peak heater-cathode voltage (Each Unit):			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200[a]	max.	volts
Direct Interelectrode Capacitances:[b]			
Triode Unit:			
Grid to plate	2		pf
Grid to cathode and heater	2.3		pf
Plate to cathode and heater	0.3		pf
Pentode Unit:			
Grid No.1 to plate	0.06	max.	pf
Grid No.1 to cathode & internal shield & grid No.3, grid No.2, and heater	5		pf
Plate to cathode & internal shield & grid No.3, grid No.2, and heater	2		pf

Equivalent-Hum and Noise Voltage (Referenced to Grid): ←

Triode Unit

Average Value (RMS)	10	microvolts
Maximum Value (RMS)	50	microvolts

Measured in "true rms" units under the following conditions: heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate load resistor (megohms) = 0.1, cathode resistor (ohms) unbypassed = 1500, grid resistor (megohms) = 0.05, and amplifier covering frequency range between 25 and 10,000 cps.

Pentode Unit

Average Value (RMS)	15	microvolts
Maximum Value (RMS)	35	microvolts

Measured in "true rms" units under the following conditions: heater volts = 6.3 ac, center-tap of heater transformer connected to ground, plate-supply volts = 250, plate-load resistor (megohms) = 0.22, grid-No.2 supply volts = 250; grid No.2 voltage divider: resistor (megohm) from grid No.2 to B+ = 0.68, resistor (megohm) from grid-No.2 to ground = 0.33; bypass ca-

← Indicates a change.

6U8-A

Mechanical:

Operating Position	Any
Maximum Overall Length	2-3/16"
Maximum Seated Length	1-15/16"
Length, Base Seat to Bulb Top (Excluding tip)	1-9/16" ± 3/32"
→ Diameter	0.750" to 0.875"
Dimensional Outline	See *General Section*
Bulb	T6-1/2
Base	Small-Button Noval 9-Pin (JEDEC No.E9-1)
Basing Designation for BOTTOM VIEW	9AE

Pin 1 – Triode Plate
Pin 2 – Pentode Grid No.1
Pin 3 – Pentode Grid No.2
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Pentode Plate

Pin 7 – Pentode Cathode, Pentode Grid No.3, Internal Shield
Pin 8 – Triode Cathode
Pin 9 – Triode Grid

→ **AMPLIFIER — Class A_1**

Maximum Ratings, *Design-Maximum Values:*

	Triode Unit	*Pentode Unit*	
PLATE VOLTAGE	330 max.	330 max.	volts
GRID-No.2 (SCREEN-GRID) SUPPLY VOLTAGE	–	330 max.	volts
GRID-No.2 VOLTAGE	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
GRID-No.1 (CONTROL-GRID) VOLTAGE: Positive-bias value	0 max.	0 max.	volts
GRID-No.2 INPUT: For grid-No.2 voltages up to 165 volts	–	0.55 max.	watt
For grid-No.2 voltages between 165 and 330 volts	–	See *Grid-No.2 Input Rating Chart* at front of Receiving Tube Section	
PLATE DISSIPATION	2.5 max.	3 max.	watts
PEAK HEATER-CATHODE VOLTAGE: Heater negative with respect to cathode	200 max.	200★ max.	volts
Heater positive with respect to cathode	200 max.	200★ max.	volts

Maximum Circuit Values:

	Triode Unit	*Pentode Unit*	
Grid-No.1-Circuit Resistance: For fixed-bias operation	–	0.5 max.	megohm
For cathode-bias operation	–	1 max.	megohm

▲ With external shield JEDEC No.315 connected to pin 4 except as noted.
● With external shield JEDEC No.315 connected to pin 6.
★ The dc component must not exceed 100 volts.

→ Indicates a change.

Medium-Mu Triode—Sharp-Cutoff Pentode

9-PIN MINIATURE TYPE

With Heater Having Controlled Warm-Up Time

GENERAL DATA

Electrical: ←

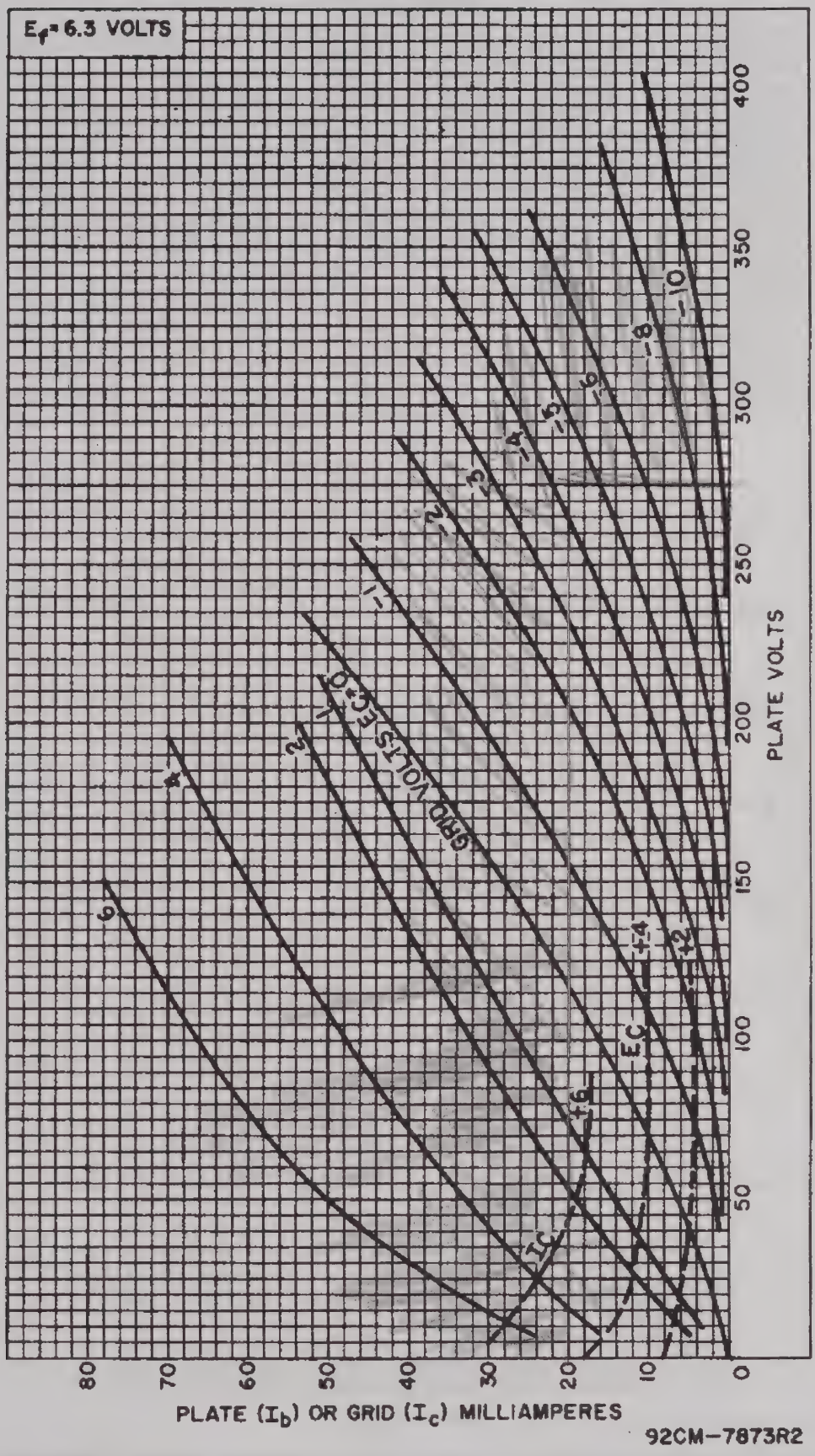
Heater, for Unipotential Cathodes:			
Voltage (AC or DC)	6.3		volts
Current	0.45 ± 6%		amp
Warm-up time (Average)	11		sec
Direct Interelectrode Capacitances:	*Without External Shield*	*With External Shield▲*	
Triode Unit:			
Grid to plate	1.8	1.8	μμf
Grid to cathode and heater	2.8	2.8	μμf
Plate to cathode and heater	1.5	2	μμf
Pentode Unit:			
Grid No.1 to plate	0.015 max.	0.007 max.	μμf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, and heater	5	5	μμf
Plate to cathode & grid No.3 & internal shield, grid No.2, and heater	2.6	3.5	μμf
Pentode grid No.1 to triode plate	0.2 max.	0.2 max.	μμf
Pentode plate to triode plate	0.1 max.	0.02 max.	μμf
Heater to cathode (Each unit)	3	3●	μμf

Characteristics, Class A_1 Amplifier: ←

	Triode Unit	*Pentode Unit*		
Plate Voltage	125	100	125	volts
Grid-No.2 Voltage	–	70	110	volts
Grid-No.1 Voltage	-1	–	-1	volt
Amplification Factor	40	–	–	
Plate Resistance (Approx.)	5400	–	200000	ohms
Transconductance	7500	5500	5000	μmhos
Plate Current	13.5	–	9.5	ma
Grid-No.2 Current	–	–	3.5	ma
Grid-No.1 Voltage (Approx.) for plate μa = 20	-9	–	-8	volts

← Indicates a change.

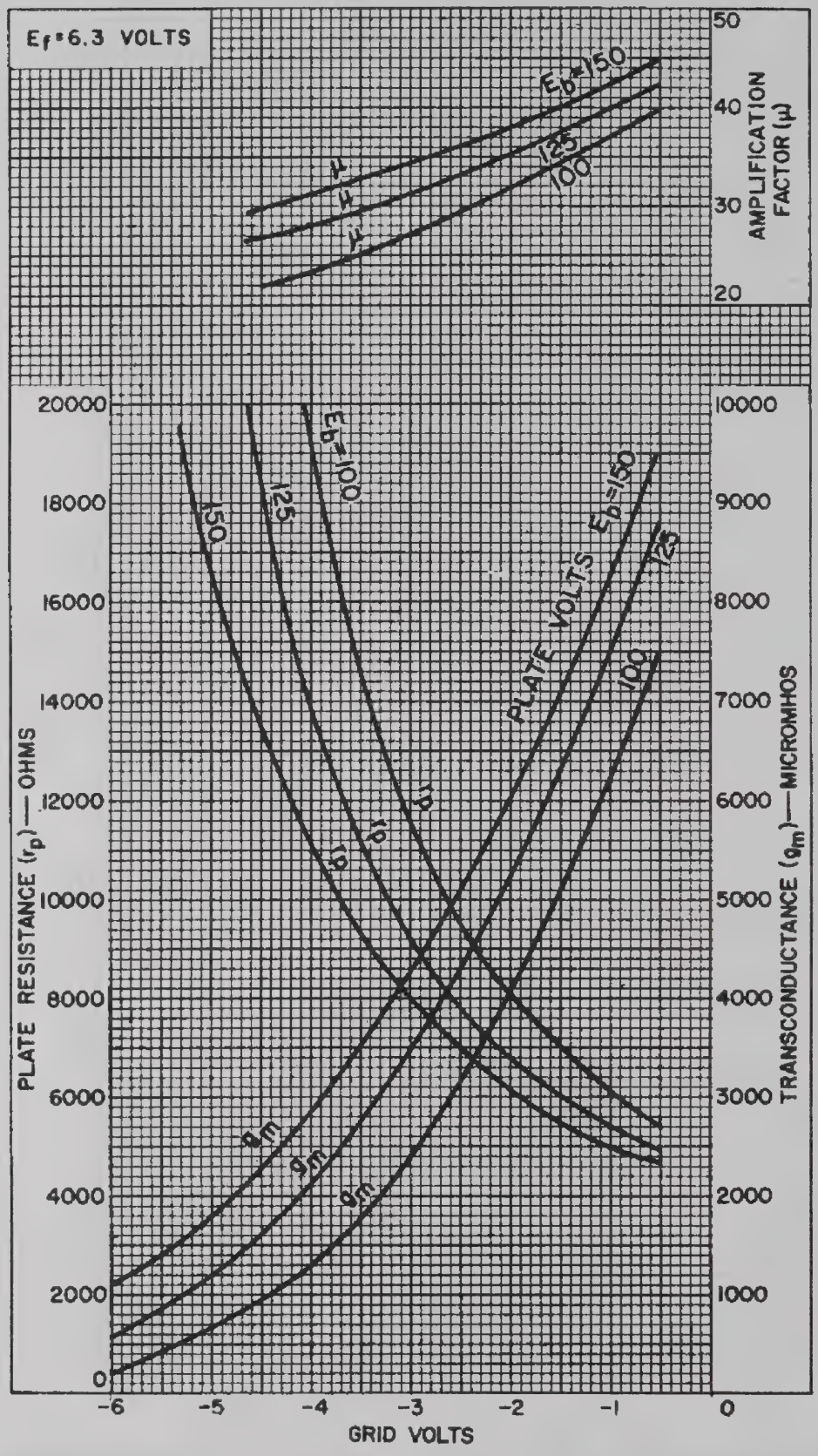
AVERAGE CHARACTERISTICS
Triode Unit



92CM-7873R2

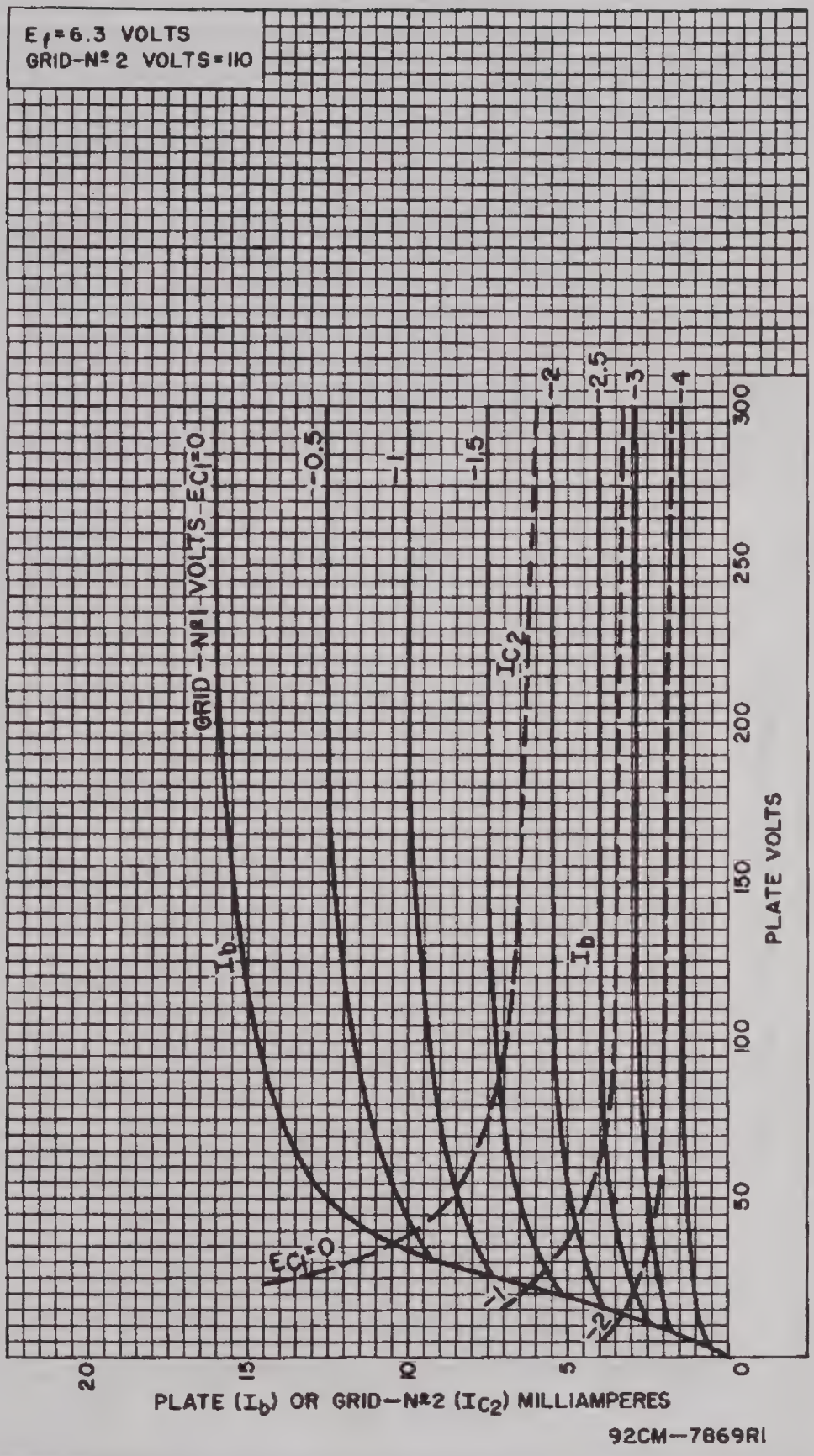
6U8-A

AVERAGE CHARACTERISTICS
Triode Unit



92CM-10900

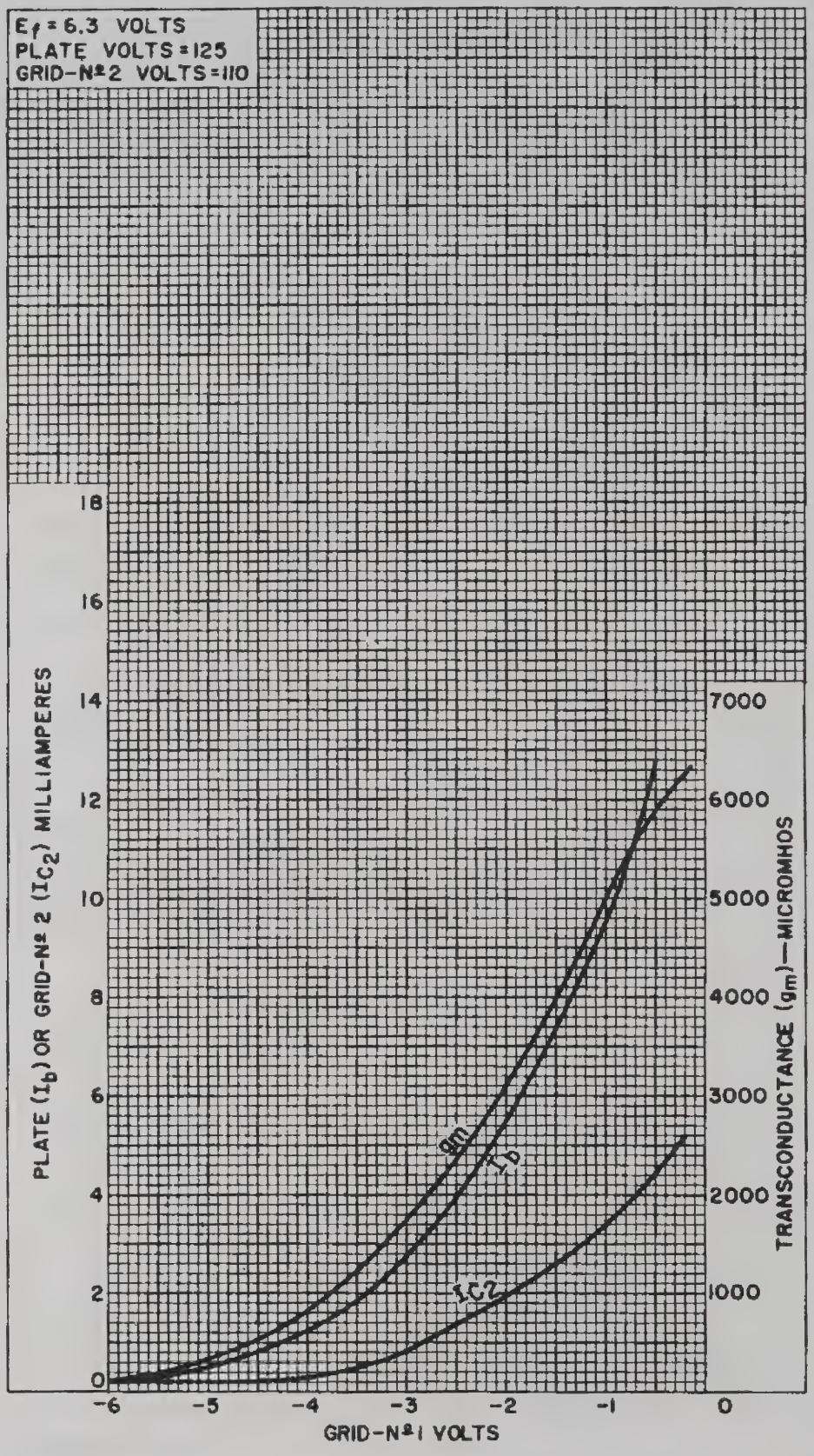
AVERAGE CHARACTERISTICS
Pentode Unit



92CM-7869RI

6U8-A

AVERAGE CHARACTERISTICS
Pentode Unit



92CM-10902

RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

MAXIMUM CIRCUIT VALUES

Grid-Circuit Resistance:			
For grid-resistor-bias or cathode-bias operation	2.2	2.2	megohms

• Under no circumstances should this absolute value be exceeded.

Pulse duration must not exceed 15% of a vertical scanning cycle (2.5 milliseconds).

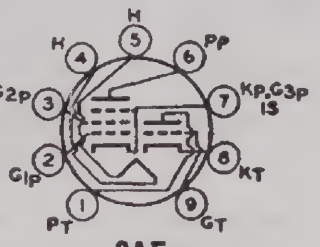
Refer to chart at end of section. 6GH8

6GH8A

5GH8A, 9GH8A

MEDIUM-MU TRIODE—SHARP-CUTOFF PENTODE

Miniature type used in multivibrator-type horizontal-deflection circuits and for agc-amplifier or sync-separator applications in color and black-and-white television receivers. Outlines section, 6B; requires miniature 9-contact socket. Types 5GH8A and 9GH8A are identical with type 6GH8A except for heater ratings.



9AE

	5GH8A	6GH8A	9GH8A	
Heater Voltage (ac/dc)	4.7	6.3	9.45	volts
Heater Current	0.6	0.45	0.3	ampere
Heater Warm-up Time (Average)	11	11	—	seconds
Heater-Cathode Voltage:				
Peak value	±200 max	±200 max	±200 max	volts
Average value	100 max	100 max	100 max	volts
Direct Interelectrode Capacitances:		*Unshielded*	*Shielded*	
Triode Unit:				
Grid to Plate		1.7	1.7	pF
Grid to Cathode, Heater, Pentode Grid No.3, Pentode Cathode, and Internal Shield		3	3.2	pF
Plate to Cathode, Heater, Pentode Grid No.3, Pentode Cathode, and Internal Shield		1.4	1.9	pF
Heater to Cathode		3	3	pF
Pentode Unit:				
Grid No.1 to Plate		0.02 max	0.01 max	pF
Grid No.1 to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield		5	5	pF
Plate to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield		2.6	3.4	pF
Heater to Cathode, Grid No.3, and Internal Shield		3	3	pF

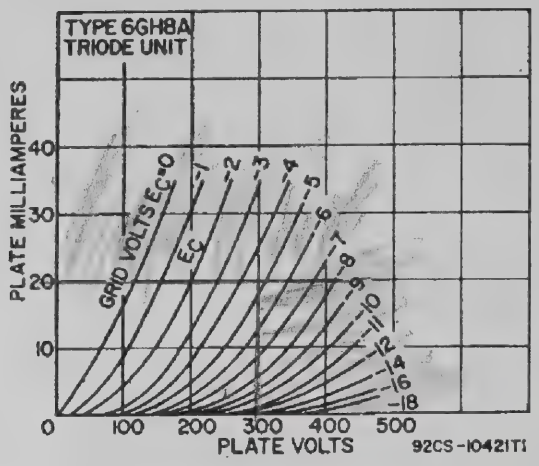
Class A_1 Amplifier

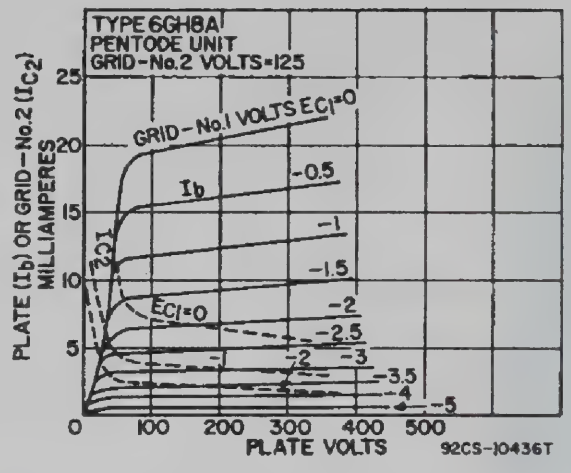
CHARACTERISTICS	Triode Unit	Pentode Unit	
Plate Voltage	125	125	volts
Grid-No.2 Voltage	—	125	volts
Grid-No.1 Voltage	—1	—1	volts
Amplification Factor	46	—	
Plate Resistance (Approx.)	5400	200000	ohms
Transconductance	8500	7500	μmhos
Plate Current	13.5	12	mA
Grid-No.2 Current	—	4	mA
Grid-No.1 Voltage (Approx.) for plate current of 10 μA	—8	—8	volts

Horizontal-Deflection Oscillator

For operation in a 525-line, 30-frame system

MAXIMUM RATINGS (Design-Maximum Values)	Triode Unit	Pentode Unit	
Plate Voltage	330	350	volts
Grid-No.2 (Screen-Grid) Voltage	—	330	volts
Grid-No.1 (Control-Grid) Voltage:			
Positive-bias value	0	0	volts
Peak negative value	—	175	volts
Peak Cathode Current	—	300	mA
Average Cathode Current	—	20	mA
Plate Dissipation	2.5	2.5	watts
Grid-No.2 Input	—	0.55	watt

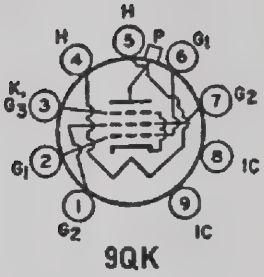




MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance:			
For fixed-bias operation	2.2	2.2	megohms
For cathode-bias operation	2.2	2.2	megohms

Refer to chart at end of section. **6GJ5**



9QK

BEAM POWER TUBE

6GJ5A

12GJ5A, 17GJ5A

Novar type used in high-efficiency horizontal-deflection-amplifier circuits of television receivers. Outlines section, 18A; requires novar 9-contact socket. For curve of average characteristics see type 6GW6. Types 12GJ5A and 17GJ5A are identical with type 6GJ5A except for heater ratings.

	6GJ5A	12GJ5A	17GJ5A	
Heater Voltage (ac/dc)	6.3	12.6	16.8	volts
Heater Current	1.2	0.6	0.45	amperes
Heater Warm-up Time (Average)	—	11	11	seconds
Heater-Cathode Voltage:				
Peak value	±200 max	±200 max	±200 max	volts
Average value	100 max	100 max	100 max	volts
Direct Interelectrode Capacitances (Approx.):				
Grid No.1 to Plate			0.26	pF
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3			15	pF
Plate to Cathode, Heater, Grid No.2, and Grid No.3			6.5	pF

Class A_1 Amplifier

CHARACTERISTICS	Triode Connection	Pentode Connection		
Plate Voltage	150	60	250	volts
Grid-No.2 Voltage	150	150	150	volts
Grid-No.1 Voltage	—22.5	0	—22.5	volts
Mu-Factor, Grid No.2 to Grid No.1	4.4	—	—	
Plate Resistance (Approx.)	—	—	15000	ohms
Transconductance	—	—	7100	μmhos
Plate Current	—	390▪	70	mA
Grid-No.2 Current	—	32▪	2.1	mA
Grid-No.1 Voltage for plate current of 1 mA	—	—	—42	volts

▪ This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.

Horizontal-Deflection Amplifier

For operation in a 525-line, 30-frame system

MAXIMUM RATINGS (Design-Maximum Values)

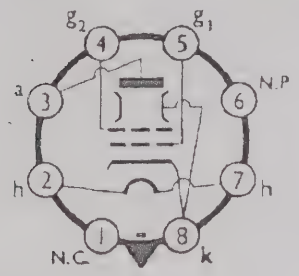
DC Plate Supply Voltage	770	volts
Peak Positive-Pulse Plate Voltage#	6500	volts
Peak Negative-Pulse Plate Voltage	1500	volts

Genalex

BEAM PENTODE
6·3V INDIRECTLY HEATED

KT66

BASE CONNECTIONS AND VALVE DIMENSIONS



View from underside of base.

Base : International Octal.
Bulb : Dom[illegible] tubular.

Overall leng[illegible]	125—135	mm.
Seated length :	111—121	mm.
Max. diameter :	53	mm.

RATING

Pentode Connection

V_h	6·3	V
I_h	1·27	A
V_a	500	V
V_{g2}	400	V
p_a	25 max.	W
p_{g2}	3·5 max	W
r_a at $V_a = V_{g2} = 250$, $V_{g1} = -15$	22·5	kΩ
g_m at $V_a = V_{g2} = 250$, $V_{g1} = -15$	6·3	mA/V

Triode Connection

V_a	400		250	V
p_a	28·5		28·5	W
r_a	at $V_{g1} = -38$ 1·45		at $V_{g1} = -19$ 1·3	kΩ
g_m	at $V_{g1} = -38$ 5·5		at $V_{g1} = -19$ 6·15	mA/V

CAPACITANCES (of unscreened valve)

$c_{g1\text{-}all}$	16	pF	$c_{a\text{-}all}$	11·5	pF	$c_{a\,g1}$	1·1	pF

TYPICAL OPERATION

Single Valve. Class A. Triode Connection

$V_{a,\,g2}$	250	400	V
V_{g1} (approx)	−19	−38	V
$I_{a,\,g2}$	60	63	mA
v_{in} (pk)	19	38	V
$p_{a,\,g2}$ (o)	15	25	W
R_k	315	600	Ω
R_L	2·75	4·5	kΩ
P_{out}	2·2	5·8	W
D	6	7	%

Push-Pull. Class AB1. Triode Connection (Two Valves)

Data per pair unless otherwise stated

$V_{a,\ g2}$	250	400	V
V_{g1}	−20	−38 approx.	V
$I_{a,\ g2}$	110	125	mA
$v_{in\ (pk)\ (g1\text{-}g1)}$	40	80	V
R_k (per valve)	360	600	Ω
$R_{L\ (a\text{-}a)}$	2·5	4	kΩ
P_{out}	4·5	14·5	W
D	2	3·5	%

Single Valve. Class A. Pentode Connection

V_a	250	V
V_{g2}	250	V
V_{g1}	−15 approx.	V
I_a	85	mA
I_{g2}	6·3	mA
$v_{in\ (pk)}$	15	V
$p_{a\ (o)}$	21·5	W
R_k	160	Ω
R_L	2·2	kΩ
P_{out}	7·25	W
D	9	%

Push-Pull. Class AB1. Pentode Connection (Two Valves)

Data per pair unless otherwise stated.

	No signal	Max. signal	
V_a	250	250	V
V_{g2}	250	250	V
V_{g1}	−17·5 approx.	—	V
I_a	162	165	mA
I_{g2}	12	20	mA
$v_{in\ (pk)\ (g1\text{-}g1)}$	—	36	V
p_a (per valve)	20	12	W
p_{g2} (per valve)	1·5	2·5	W
R_k (per valve)	200	200	Ω
$R_{L\ (a\text{-}a)}$	—	4	kΩ
P_{out}	—	17	W
D	—	4	%

Push-Pull. Class AB1. Pentode Connection (Two Valves)

Data per pair unless otherwise stated.

	No signal	Max. signal	
$V_{a\ (b)}$, $V_{g2\ (b)}$	450	425	V
V_a	415	390	V
V_{g2}	300	275	V
I_a	104	125	mA
I_{g2}	5	18	mA
$v_{in\ (pk)\ (g1\text{-}g1)}$	—	70	V
p_a (per valve)	21·5	9·5	W
p_{g2} (per valve)	0·75	2·5	W
R_k (per valve)	500	500	Ω
$R_{L\ (a\text{-}a)}$	—	8	kΩ
P_{out}	—	30	W
D	—	6	%
$V_{a\ (rms)}$ (to rectifier)	—	500+500	V
R_{source} (HT)	—	600	Ω

Push-Pull. Class AB_1. Pentode Connection. Fixed Bias. (Two Valves)

Data per pair unless otherwise stated.

	No signal	Max. signal	
V_a	510	475	V
V_{g2}	395	360	V
V_{g1}	−40 approx.	—	V
i_a	80	175	mA
I_{g2}	3	19	mA
V_{in} (pk) (g1-g1)	—	80	V
p_a (per valve)	21	17	W
p_{g2} (per valve)	0·6	3·5	W
R_L (a-a)	—	5	kΩ
P_{out}	—	50	W
D	—	5	%

Screen grids supplied from stabilised source.

GENERAL

For the prevention of parasitic oscillation a series resistor of 100/300Ω should be connected close to the screen grid terminal of the valve socket. When the valve is triode connected, this resistor should be connected between screen grid and anode. A control grid series resistor of 10/50 kΩ is also recommended. In push-pull applications having a large change in anode current between the quiescent and full output conditions, an inductor input filter circuit of good regulation should be used. A badly regulated supply will cause a fall in power output and/or excessive quiescent anode dissipation.

The use of a common auto-bias resistor is not recommended except in applications where the maximum anode dissipation is not attained under any condition of operation.

The maximum permissible D.C. resistance between control grid and cathode is limited to 0·5 MΩ for auto-bias and 0·1 MΩ for fixed bias applications.

SCREENING

No internal or external screening is fitted to the valve.

MOUNTING

Any position.

RETAINING

No retaining device is normally necessary.

VENTILATION

Adequate ventilation around the bulb should be provided.

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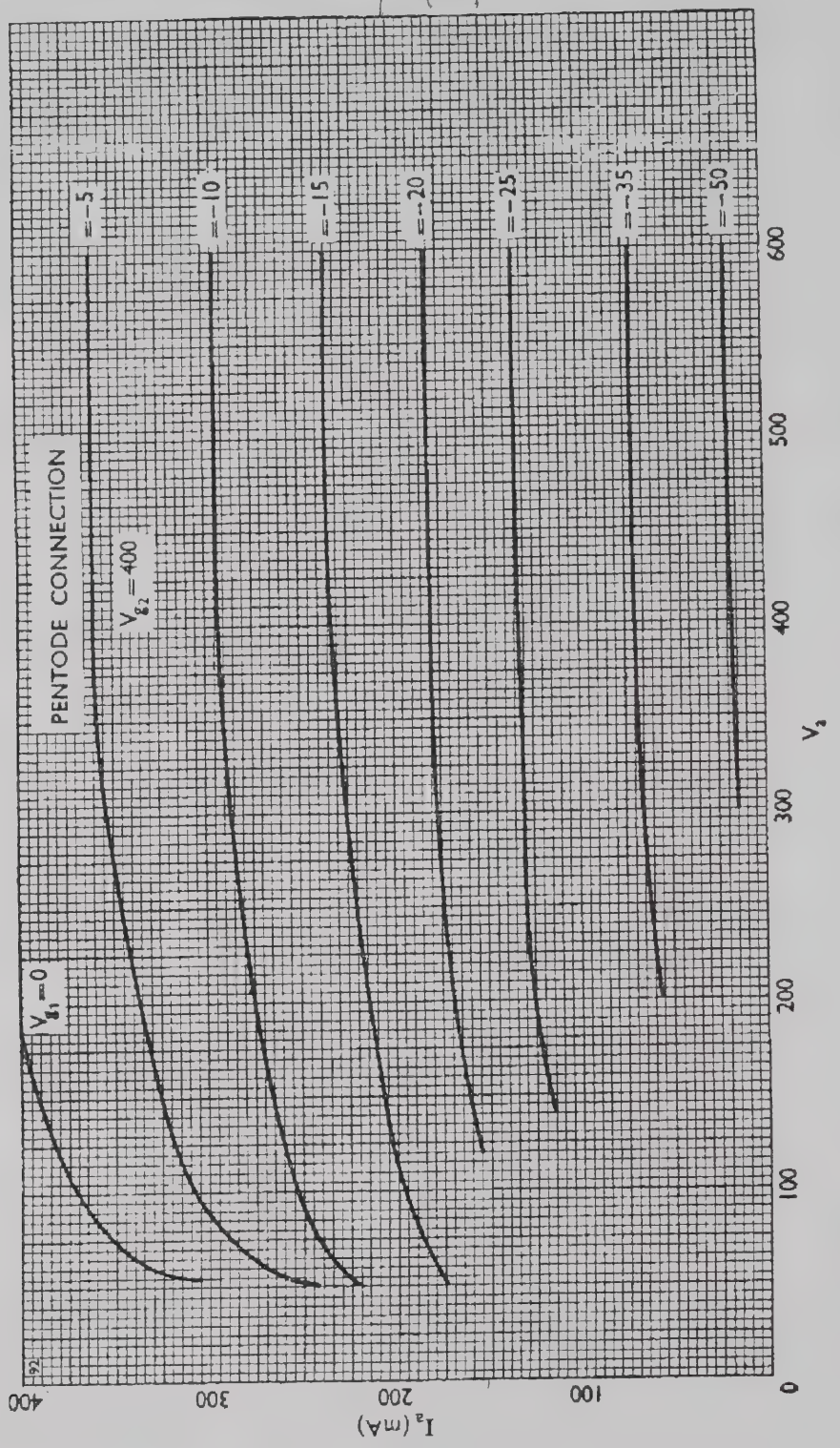
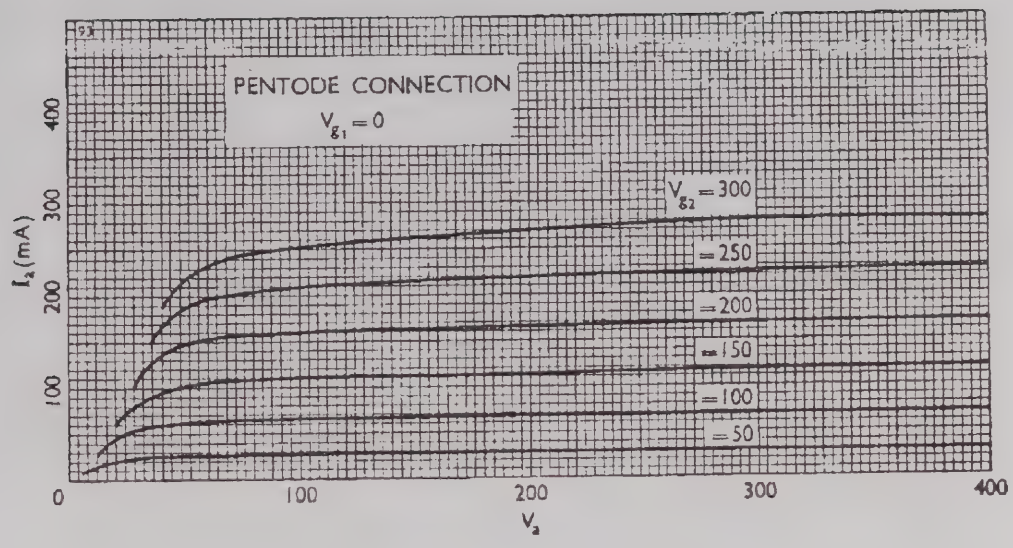
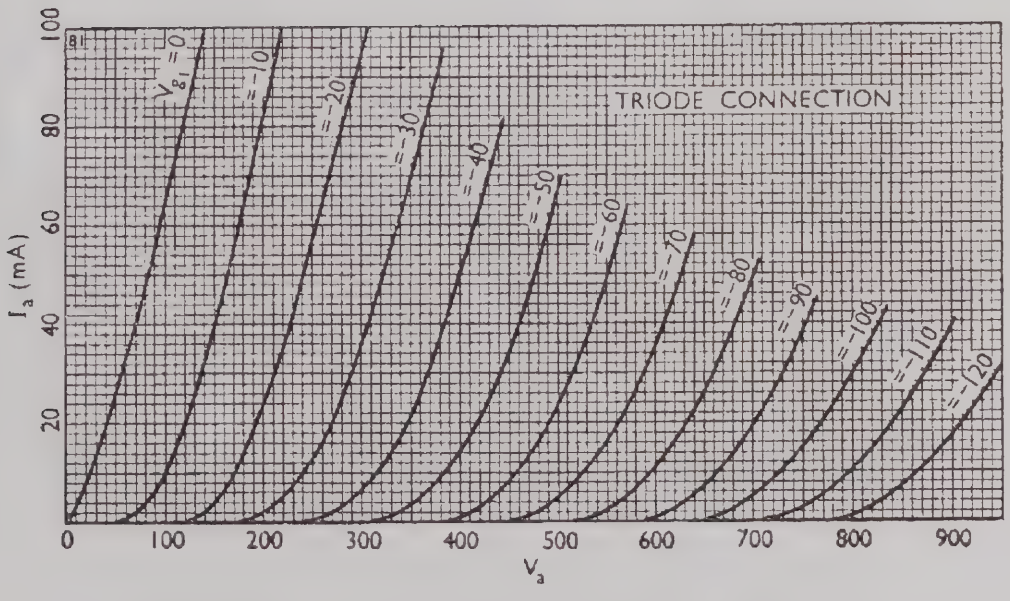

PENTODE CONNECTION
V_{g2} = 400
V_{g1} = 0
= −5
= −10
= −15
= −20
= −25
= −35
= −50
I_a (mA)
V_a
0
100
200
300
400
500
600
92


PENTODE CONNECTION
$V_{g_1} = 0$
$V_{g_2} = 300$
= 250
= 200
= 150
= 100
= 50
I_a (mA)
0
100
200
300
400
V_a


TRIODE CONNECTION
$V_{g_1} = 0$
= -10
= -20
= -30
= -40
= -50
= -60
= -70
= -80
= -90
= -100
= -110
= -120
I_a (mA)
20
40
60
80
100
0
100
200
300
400
500
600
700
800
900
V_a

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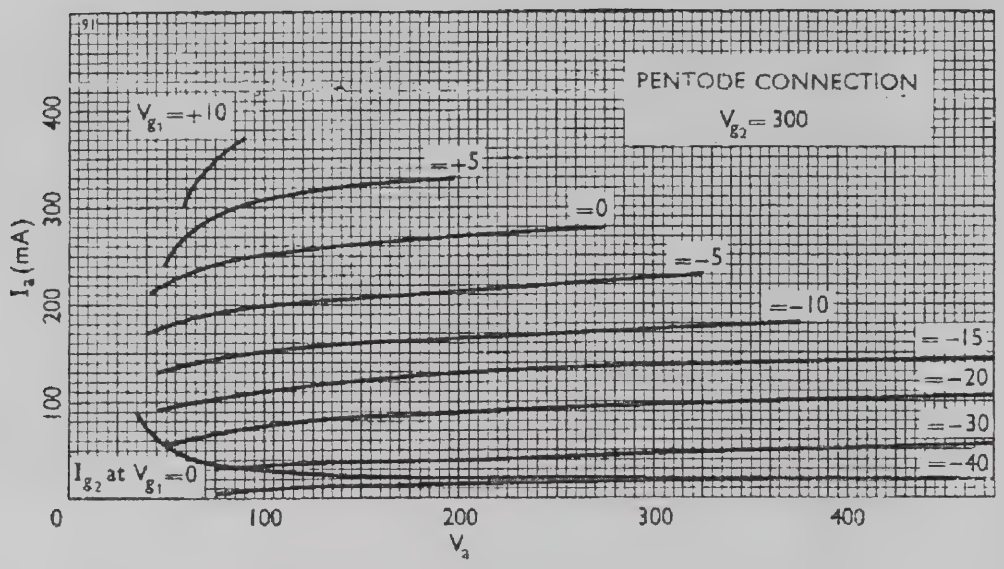
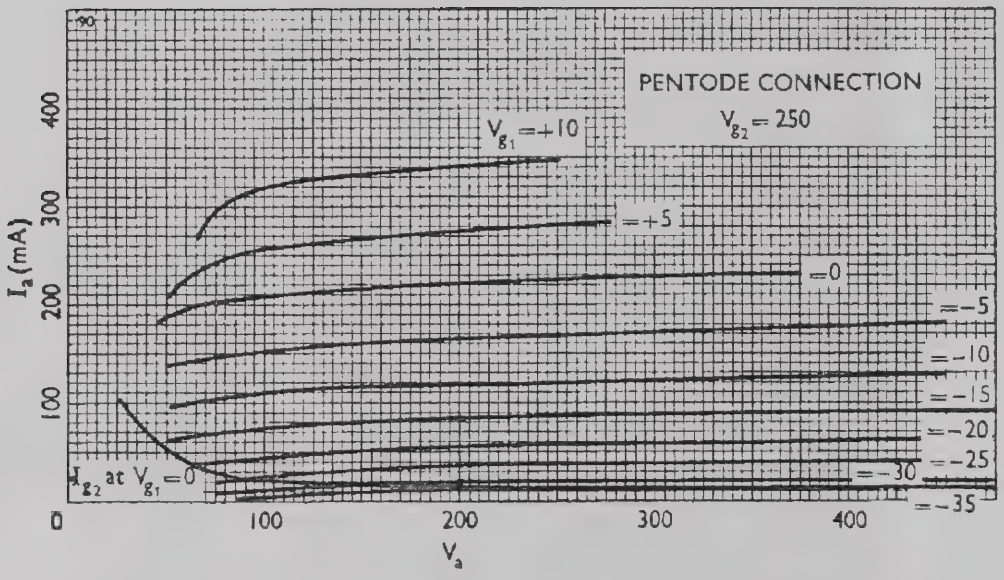
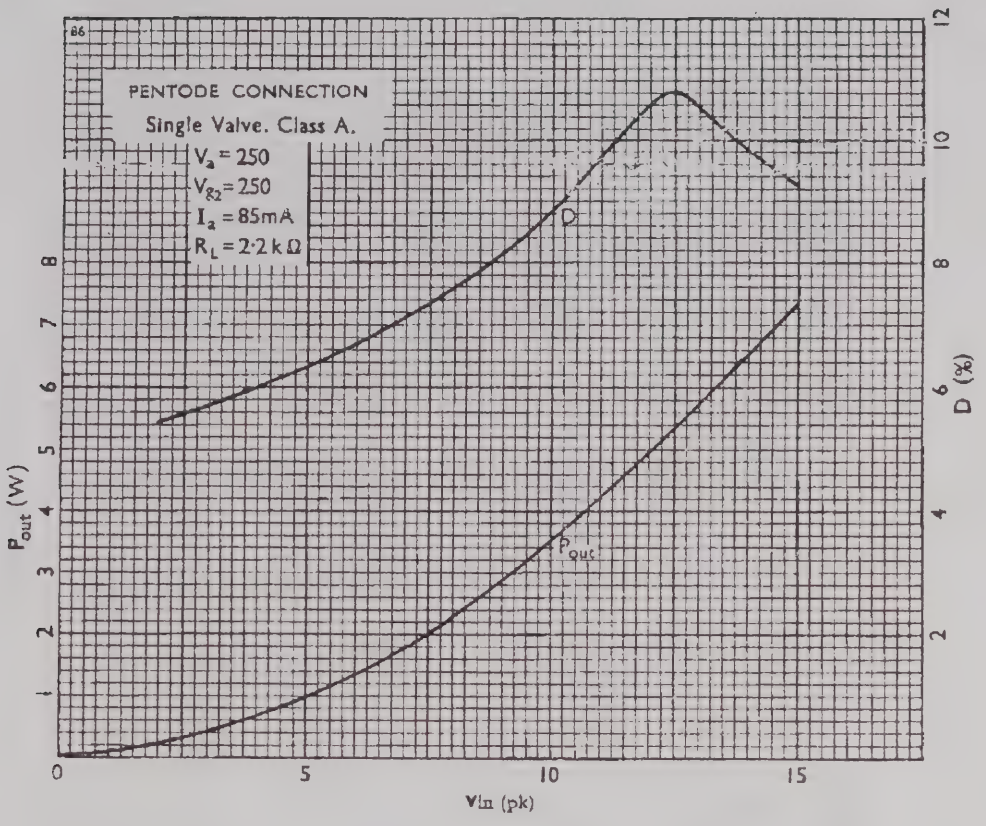
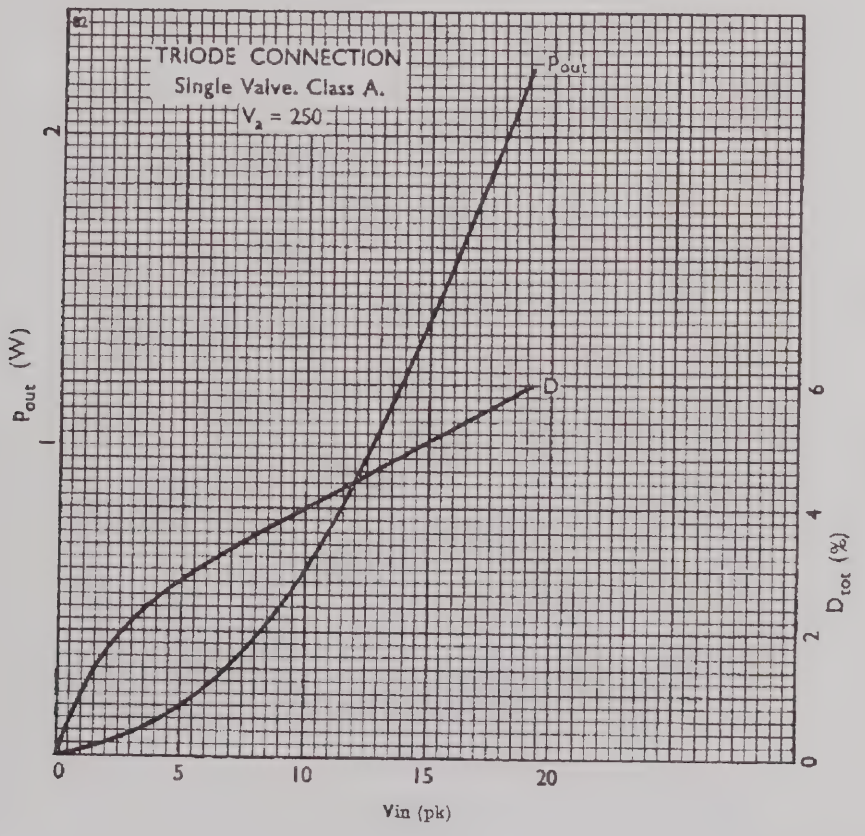

PENTODE CONNECTION
V_{g_2} = 300
V_{g_1} = +10
= +5
= 0
= −5
= −10
= −15
= −20
= −30
= −40
I_{g_2} at V_{g_1} = 0
I_a (mA)
V_a
0
100
200
300
400


PENTODE CONNECTION
V_{g_2} = 250
V_{g_1} = +10
= +5
= 0
= −5
= −10
= −15
= −20
= −25
= −30
= −35
I_{g_2} at V_{g_1} = 0
I_a (mA)
V_a
0
100
200
300
400


PENTODE CONNECTION
Single Valve. Class A.
V_a = 250
V_{g2} = 250
I_a = 85mA
R_L = 2·2 kΩ
D
P_{out}
P_{out} (W)
D (%)
Vin (pk)
0
5
10
15
1
2
3
4
5
6
7
8
2
4
6
8
10
12


TRIODE CONNECTION
Single Valve. Class A.
V_a = 250
P_{out}
D
P_{out} (W)
D_{tot} (%)
Vin (pk)
0
5
10
15
20
1
2
0
2
4
6

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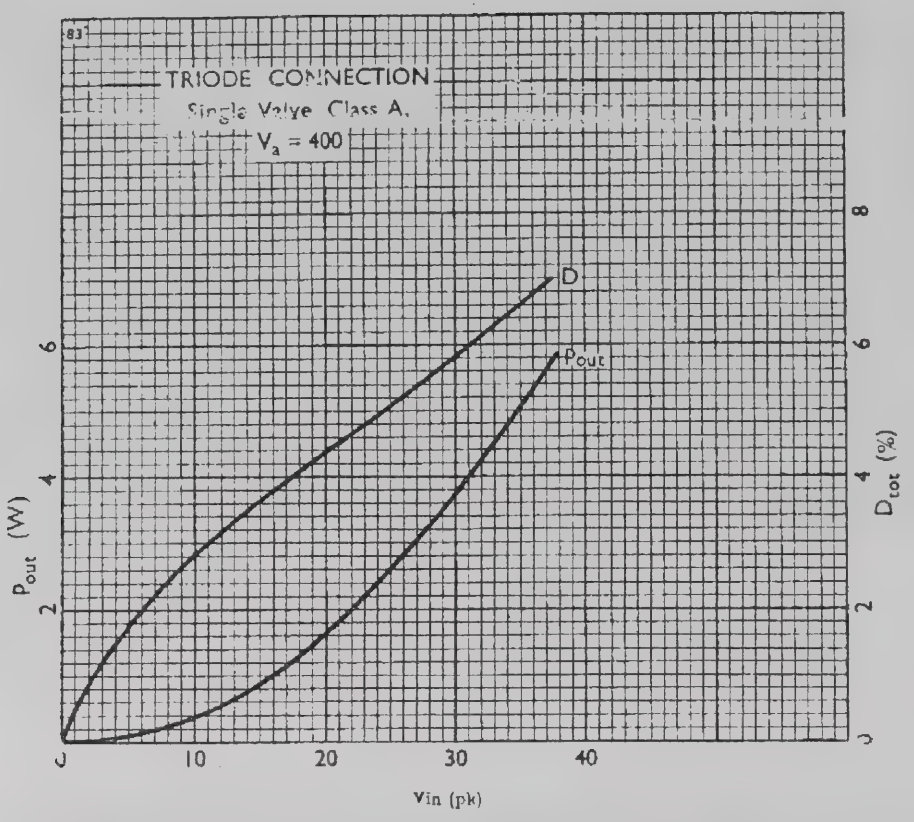
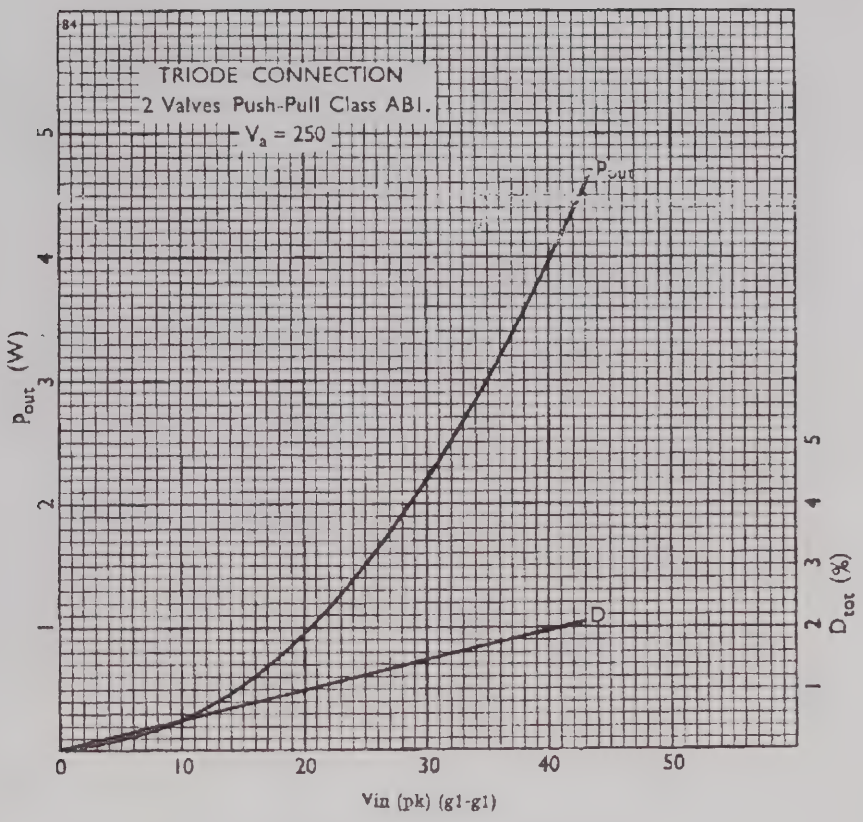
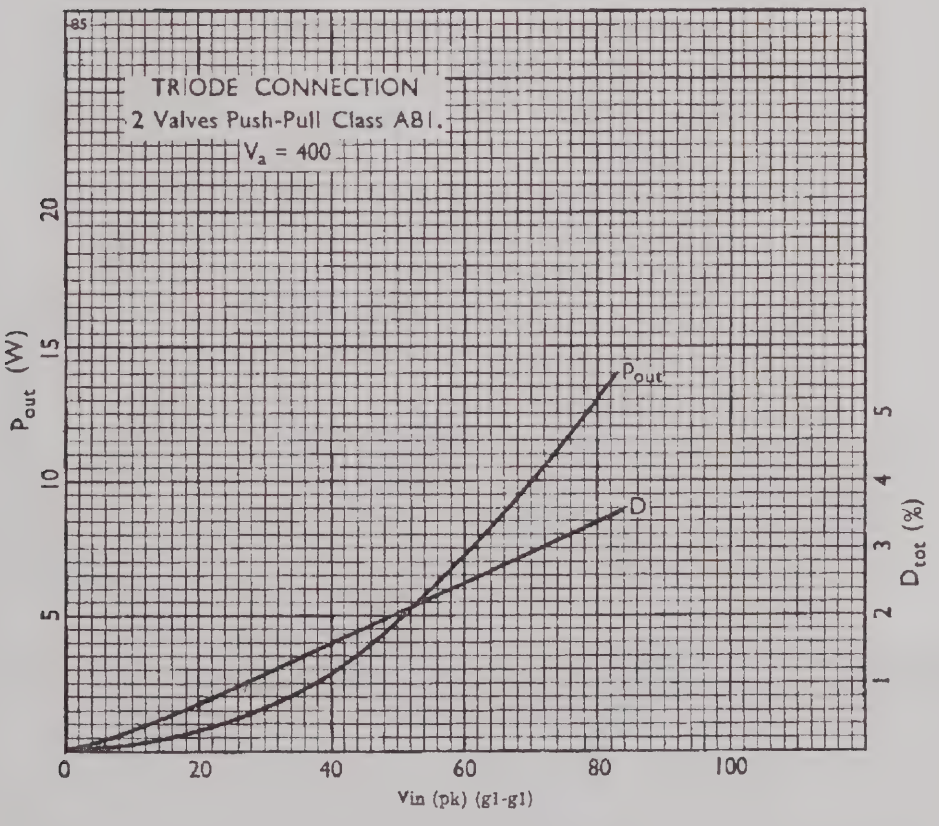
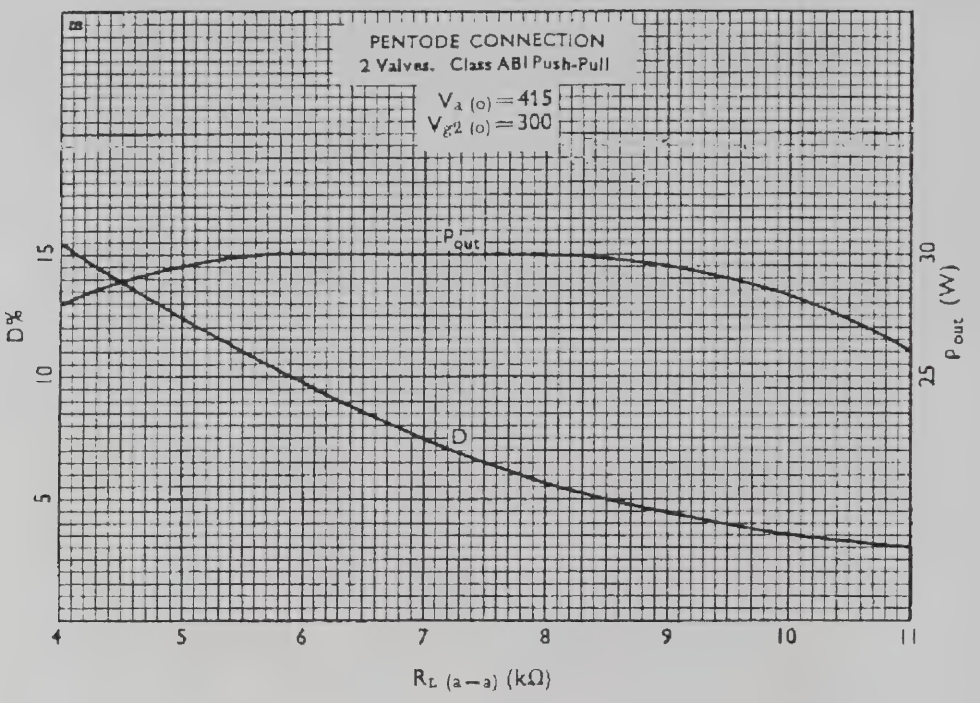
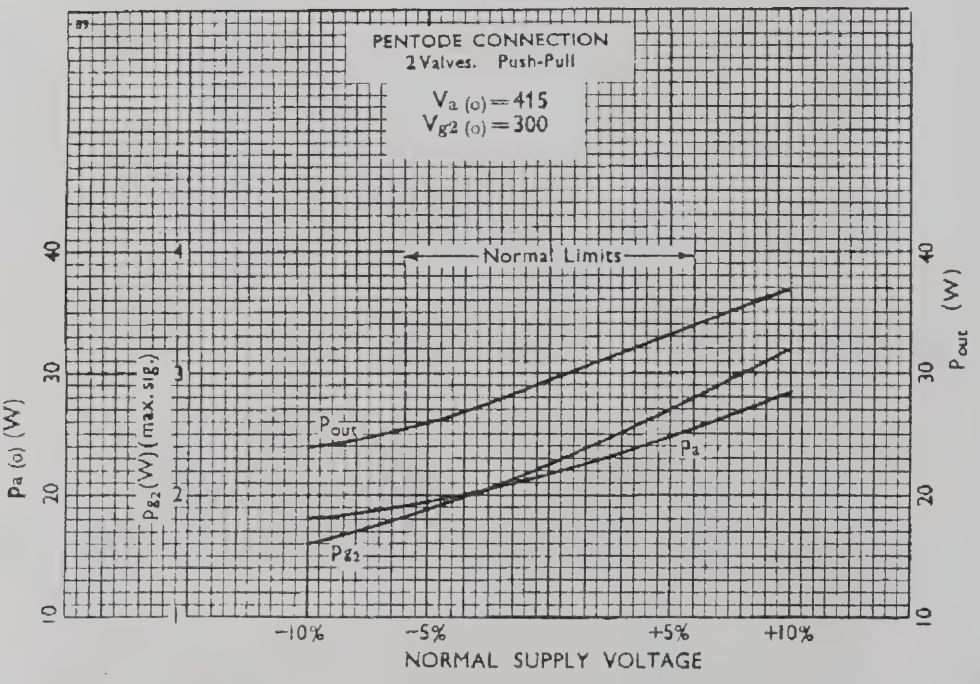

TRIODE CONNECTION
Single Valve Class A.
V_a = 400
D
P_{out}
P_{out} (W)
D_{tot} (%)
0
10
20
30
40
2
4
6
8
Vin (pk)


84
TRIODE CONNECTION
2 Valves Push-Pull Class AB1.
V_a = 250
P_{out}
D
P_{out} (W)
D_{tot} (%)
Vin (pk) (g1-g1)
0
10
20
30
40
50
1
2
3
4
5


85
TRIODE CONNECTION
2 Valves Push-Pull Class AB1.
V_a = 400
P_{out}
D
P_{out} (W)
D_{tot} (%)
Vin (pk) (g1-g1)
0
20
40
60
80
100
5
10
15
20
1
2
3
4
5

KT66


PENTODE CONNECTION
2 Valves. Class AB1 Push-Pull
$V_{a\ (o)} = 415$
$V_{g2\ (o)} = 300$
P_{out}
D
D%
P_{out} (W)
$R_{L\ (a-a)}$ (kΩ)


PENTODE CONNECTION
2 Valves. Push-Pull
$V_{a\ (o)} = 415$
$V_{g2\ (o)} = 300$
Normal Limits
P_{out}
P_a
P_{g2}
$P_{a\ (o)}$ (W)
P_{g2} (W) (max. sig.)
P_{out} (W)
−10%
−5%
+5%
+10%
NORMAL SUPPLY VOLTAGE

KT66

NEW

A. F. BEAM PENTODE
Base: OCTAL

U_f = 6,3 V
I_f = cca 1,3 A

Typical characteristic:

U_a = 250 V
U_{g2} = 250 V
$-U_{g1}$ = 15 V
I_a = 85 mA
I_{g2} = max. 7 mA
S = 6 mA/V
R_i = 22,5 kΩ

Triode connected
$U_{a,g2}$ = 250 V
$-U_{g1}$ = 15 V
R_a = 1,3 kΩ

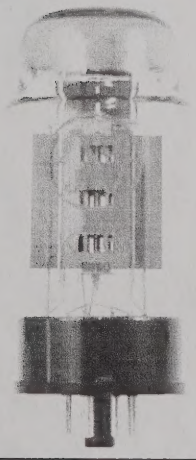
Limiting values:

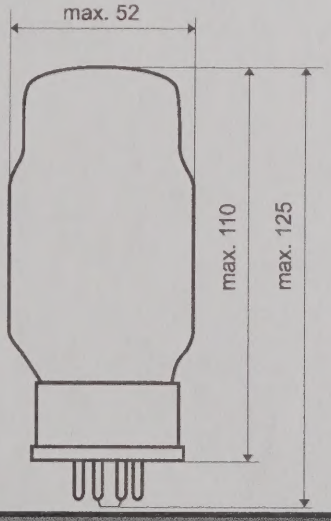
U_a = 550 V
U_{g2} = 550 V
$-U_{g1}$ = 200 V
W_a = 25 W
W_{g2} = 3,5 W
$W_{a,g2}$ = 27 W
I_k = 150 mA
$U_{k/f}$ = 200 V
R_{g1-k} (catode bias)
$W_{a+g2} \leq$ 27 W 1 MΩ
$W_{a+g2} >$ 27 W 500 kΩ
R_{g1-k} (fixed bias)
$W_{a-g2} \leq$ 27 W 220 kΩ
$W_{a+g2} >$ 27 W 100 kΩ

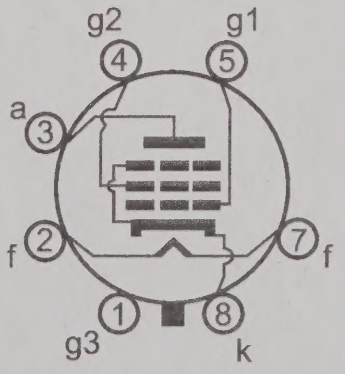
Capacitances:

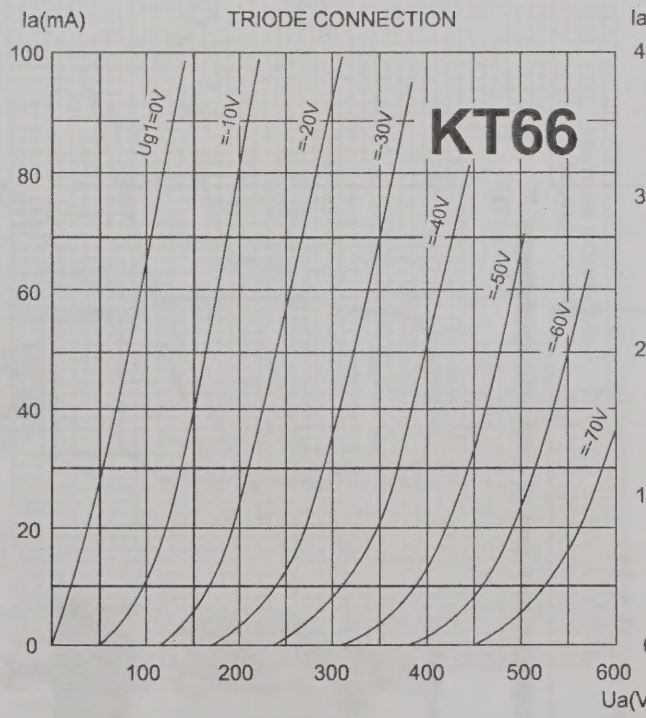
C_{g1} = 16 pF
C_a = 10 pF
$C_{a/g1}$ = 2,3 pF

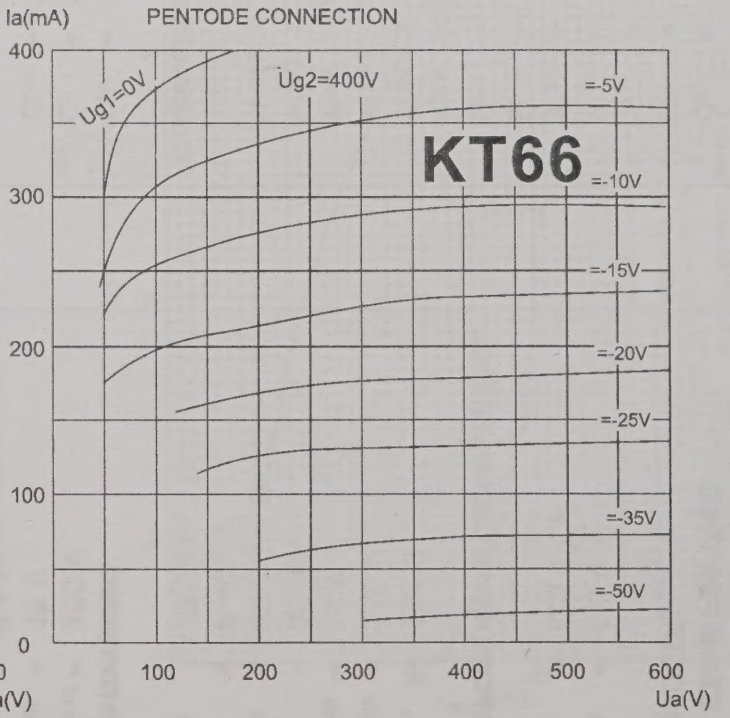
Dimension and connections:











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